The Iron Age

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Modern Bronze Alloys for Engineering Purposes.

The following is an abstract of a paper read by Mr. Perry F. Nursey, before the British Society of Engineers, at their recent meeting:

Bronze pure and simple consists of a mixture of copper and tin in certain proportions. These proportions, as we have seen, are varied according to the purpose for which the compound is intended. Other metals, moreover, such as zinc, lead, phosphorus, manganese, silicium and iron, may be and have been added without unclassifying the product, which is still called bronze, provided that copper and tin are the chief constituents. The bronzes of France are known to contain nearly always four metals—namely, copper, tin, lead and zinc. It is also stated that some contain minute and variable quantities of nickel, arsenic, antimony and sulphur. It is the addition to bronze pure and simple of certain proportions of one or other of the metallic substances previously referred to that constitutes the modern development of bronze manufacture, and which has given us some of the most useful, and at the same time some of the most remarkable, alloys known. These comprise no fewer than 11 distinct products, all of which find their uses in connection with the practice of engineering. These are: Phosphor-bronze, silicium-bronze, manganese-bronze, delta metal, phosphor-copper, phosphor-manganese bronze, phosphor-lead bronze, phosphor-tin, aluminium-bronze, silverloid and cobalt bronze. These alloys form the subject for present consideration. There are other bronzes which are used as substitutes for gold in cheap imitation jewelry, but, although they are in the main only variations of some of the bronzes with which the author has to deal, their applications are such that their notice does not fall within the scope of the present paper.

Attention was directed some years since to the use of phosporus in improving the character of bronze for various purposes, and eventually with very successful results. The action of phosphorus on copper alloys is principally due to its reducing qualities, by virtue of which the oxygen absorbed by the the molten metal is removed, or, rather, the oxides thereby produced are eliminated, and there is imparted to the metal that degree of homogeneity, strength and toughness which is peculiar to the chemically pure metal. The phosphorus, by producing these effects, is converted into cuprous oxide (?), which floats on the surface of the molten metal in the shape of a very fluid slag, while the superfluous quantity combines with the metal. This being the case, it is not desirable to add to the bronze a larger quantity of phosphorus than will suffice to reduce the oxide present. It is thought by some that the phosphorus itself imparts to the bronze the qualities of hardness and strength, and that therefore the more phosphorus put into the metal the better the result as regards hardness. This, however, is not the case, inasmuch as hardness would be obtained at the expense of toughness. The question of producing the various qualities of this class of metal depends not so much upon the quantity of phosphorus as upon the correct proportioning of the various ingredients, phosphorus included. Some of the alloys to which the author will direct attention are formed by the addition of a small proportion of a compound of phosphorus and copper or other metal to the bulk of the copper to be treated. Inasmuch, however, as great care is required in determining the exact proportions of the ingredients in making phosphor-bronze alloys, it appears to the author that it would be much safer and probably much more economical for manufacturing engineers to obtain the alloys ready prepared for the special purpose for which they require them, and which would, other things being equal, obviate all chance of failure by reason of a careless workman adding too little or too much of the phosphorized metal to the bulk.

PHOSPHOR-BRONZE.

The first of the modern bronzes for notice in the order of time is phosphor-bronze, which was invented by Dr. Künzel, of Biasewitz, Dresden, and was brought into practical use in this country early in 1873 by the Phosphor-Bronze Company, who have from time to time patented several improvements both as regards alloys and methods of manufacture. Phosphor-bronze alloys are composed of copper, tin, phosphorus, and other ingredients in definite proportions, and are made to be either as ductile as copper, as tough as iron or as hard as steel, accordingly as the proportions of the constituents are varied. The alloys used for rolling and drawing have very different proportions to those employed for castings, for bearings and parts of machinery. The castings of the metal, owing to its great fluidity when melted, are perfectly sound and homogeneous. Wherever strength, toughness and durability are desiderata, phosphor-bronze is found to be far better adapted than gun-metal and brass, and in many cases than iron and steel. With regard to the applications of phosphor-bronze, it may truly be said that their name is legion. This remark applies in the main to most of the modern bronze alloys presently to be described, so that, in order to save repetition, the author will here observe that chief among their many applications are the manufacture of wire, rods, tubes, sheets, ornamental castings, screw propellers, pinions, cylinders, valves, bearings, bushes and other parts of machinery exposed to friction.

Phosphor-bronze possesses the advantage of not becoming crystalline under the action of repeated shocks and bends, and is therefore well adapted for making wire rope, and as it is not acted on by corrosive liquids, as found in mines, or by the atmosphere, its value as a metal remains constant. It is being used in the shape of sheets for the hulls of torpedo boats and steam launches with satisfactory results. In order to ascertain its resistance to the chemical action of dilute sulphuric acid, two similar sheets of copper and of phosphor-bronze were immersed in acid water, 10° Beaumé strength, and at the temperature of the surrounding atmosphere; after three months it was found that the copper had lost 4.15 per cent. and the phosphor-bronze only 2.3 per cent. Phosphor-bronze sheet, moreover, stands the action of sea water much better than copper. In a comparative experiment made at Blackenberge, lasting over a period of six months, between the best English copper and phosphor-bronze, the following results were arrived at: The loss in weight due to the oxidizing action of sea water averaged for the copper 3.058 per cent., while that of phosphor-bronze was but 1.58 per cent.

In making castings from phosphor-bronze alloys, a new or clean plumbago crucible is used, so as to avoid any admixture of other metals, and some charcoal or coke is kept on the metal during the melting to prevent oxidation. For large castings the molds are thoroughly dried and dressed with a mixture of blacklead and water. Small work is cast green. In order to avoid segregation it is necessary to pour phosphor-bronze alloys only just before the setting takes place. This is accomplished by cooling the molten metal by putting in ingots or runners, and, when the metal no longer melts these, but adheres to them, it is a sign that the pouring should take place. Previously to pouring, the molten mass is well stirred by means of an iron rod covered with a paste of either fire-clay or plumbago. Besides the original phosphor-bronze with which the author has dealt so far, the Phosphor-Bronze Company a year or two ago brought out two other varieties. These were the outcome of an endeavor on the part of the company to meet as far as practicable the various requirements of engineers and millwrights, particularly in connection with parts of machinery exposed to combined friction and pressure.

By slightly changing the proportions of the component parts of some of the ordinary mixtures, new alloys having very valuable and distinct characteristics have been produced, and which have been practically tried and proved. These new alloys are known as phosphor-bronze duro A, and phosphor-bronze duro B. Duro A is a very dense metal, adapted for all bearings carrying heavy wheels running at great velocities, and generally for all quick-speed purposes. Duro B is intended for the bearings of hot-neck rolls, and for all bearings having to withstand great pressure, such as plate and sheet roll bearings, and for general engine purposes. * * * * * *

SILICIUM-BRONZE.

We come in the next place to silicium-bronze, which in some respects may be considered as an outcome of phosphor-bronze, although its invention is not due to Dr. Künzel, who died some years ago. The inventor is M. Lazare Weiller, of Angoulême, who exhibited phosphor-bronze telegraphic and telephonic conductors at the Paris Electrical Exhibition of 1881, where the author first saw them, and where they were novelties. M. Weiller carried out an exhaustive series of experiments with this wire, the results of which went to show that it possessed a conductivity one-third that of copper, but two and-a-half times that of iron and steel. Phosphor-bronze wires, therefore, proved very useful for telephonic communication, but not for telegraphic purposes, where higher conductivity is required. M. Weiller, therefore, set himself the task of discovering a material analogous to phosphor-bronze, and his labors were at length crowned with success by the discovery of silicium-bronze. In this alloy the phosphorus is replaced by a silicious metalloid which produces a better conductor than does phosphor-bronze wire, but with a much higher degree of conductivity, rendering it applicable for telegraph lines, and bringing the valuable qualities of lightness and non-oxidizability within easy and economical reach.

In a paper upon electrical conductors, read by Mr. W. H. Preece, F.R.S., before the Institution of Civil Engineers, in December, 1883, that gentleman observed in reference to phosphor and silicium bronze wires that in their manufacture phosphorus and silicium had the property of removing impurities, particularly the oxides, though doubtless some of the flux remained. Phosphorus had a most injurious influence on the electrical resistance of the alloy. Silicium was far superior; hence the silicium-bronze was preferable for telegraphic purposes. Its efficiency was very great; in fact, phosphor-bronze had disappeared for telegraph wire and had been replaced by silicium-bronze. It is important to note that the properties of this alloy are such that, although the wires are only one-tenth as heavy as the ordinary wires, they are of equal strength. Moreover, it is affirmed that, if broken, they will not fall to the ground, as the ordinary wires do, but by reason of their high elasticity they will spring back and coil up close to the standards. The author should mention that M. Weiller has associated himself with the Phosphor Bronze Company, who are manufacturing silicium-bronze wire, which, the author is informed, has come largely into use for overhead telephone lines, and proves a satisfactory substitute for the cumbrous iron wire. The following table shows the relative strength, resistance and conductivity of various wires:

Description of wire.	Tensile strength per square inch in tons.	Resistance per mile in ohms.	Relative conductivity.
Pure copper	17.78	33.1	100
Silicium-bronze (telegraph)	28.57	34.5	96
Silicium-bronze (telephone)	48.25	103	34
Phosphor-bronze (telephone)	45.71	124	26
Swedish galvanized iron	22.86	216	16
Galvanized Bessemer steel	25.40	249	13
Siemens-Martin steel	26.67	266	12

(To be continued.)

The Iron and Steel Trades in Russia.—For the purpose of fostering the native metallurgical and engineering industries in Russia, the State has since 1876 offered premiums on the manufacture of such articles as steel rails, locomotives, railway wagons, &c. The sums received by manufacturers since 1879 are given as follows: 1880, 2,929,051 roubles; 1881, 2,039,515; 1882, 1,034,787; 1883, 748,487, while for 1884 the amount is estimated at 1,950,000. On rails completely manufactured in Russia before May 14, 1885, the Government offer a premium of 35 copecks per poud (about ⅞ cent per pound). On rails manufactured only in part in Russia 20 copecks per poud are offered until May 14, and 15 copecks after that date. The aggregate output of the rolling mills during 1885 is expected to reach 5,080,000 pouds (91,440 net tons).

Measurements of Friction of Lubricating Oils.*

At the meeting of this society, held in November, 1880, the writer presented a paper under this same title,† giving the comparative results of some measurements of friction upon a variety of lubricating oils, submitted to a somewhat narrow range of conditions. On this occasion it is proposed to treat the subject from a different, but perhaps equally practical, point of view, and limit the subject to the examination of a single lubricant under a wide range of investigation. In the course of some work on this subject for the Factory Mutual Insurance Companies it became a matter of importance to know the coefficient of friction of a lubricant at a series of temperatures and pressures. These measurements were made upon another machine designed by the writer, similar in principle, but differing from the one used in the previous experiments in its general construction. The earlier machine was made for the specific purpose of testing spindle oils, and fulfilled conditions of high speeds and light pressures in a satisfactory manner, but was unsuited for work with heavy pressures upon the standard bearing where the friction was measured. A standard brand of mineral oil, free from admixture of any animal oil, was selected for these experiments, because previous experience had shown that it was more uniform than any other lubricating oil, and duplicate samples could be obtained when desired. A test of this oil showed:

Flash	342° F.
Fire	410° F.
Evaporation by exposure to 140° F. for 12 hours	.02
Specific gravity	.888

The operation of the machine is based on the principle of measuring the friction between two annular disks, and the whole designed for the purpose of observing this with precision. The machine shown in perspective in Fig. 1, and in elevations in Figs. 2 and 3, consists of a cast-iron frame in the form of an arch, with a brace at the rear, and further stiffened with transverse webs arranged to present the utmost rigidity against the stresses liable to be applied to the machine. The lower disk is secured upon the top of an upright shaft, its top being an annulus, ground to a true plane surface. Upon this rests the upper disk, which is in the form of a hollow ring based upon a flat plate, and is made of very hard composition, cast in one piece. The bottom of this disk is scraped to a true plane surface, so that the contact between these two disks is uniform. A partition divides the interior of the hollow ring forming the upper disk, so that water can be introduced through the connecting tubes to control the temperature of the disks, and in some instances it is desired to use the water as a medium to retain the heat of friction. The sides and top of the

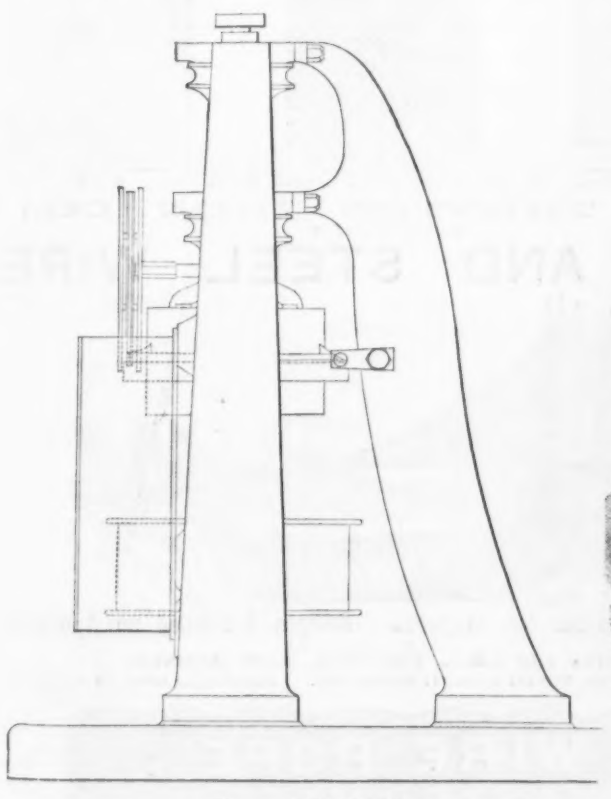

Fig. 2.—Side Elevation.

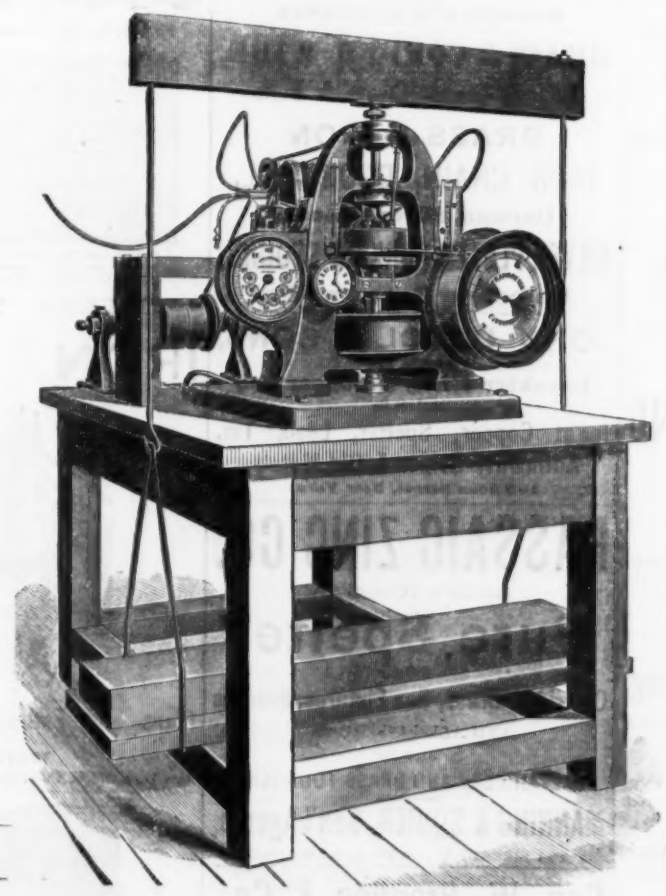

Fig. 1.—Perspective View of Testing Machine.

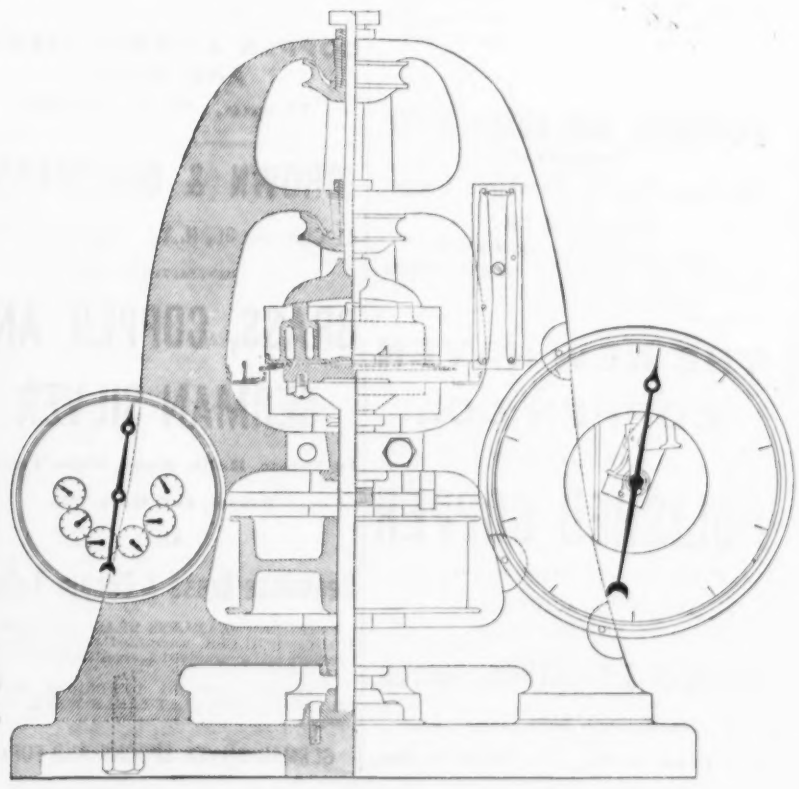

Fig. 3.—Front Elevation and Section.

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* Extracts from a paper read at the New York meeting of the American Society of Mechanical Engineers, by Mr. C. J. H. Woodbury.

† "Measurements of Friction of Lubricating Oils." Transactions A. S. M. E., Vol. i., p. 73.

(*Continued on page 9.*)

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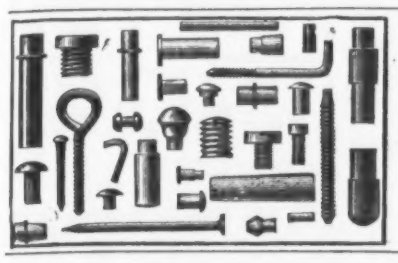

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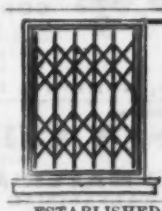

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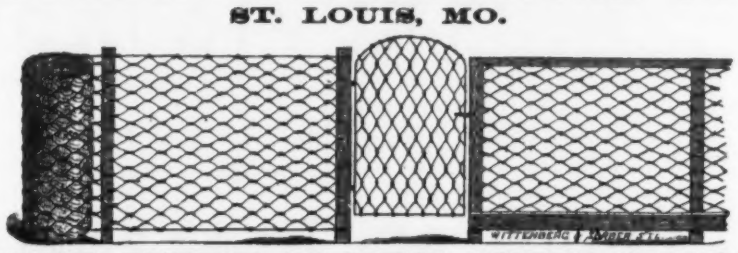

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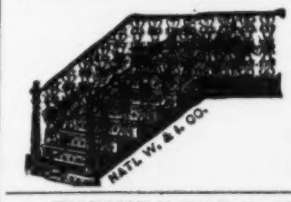

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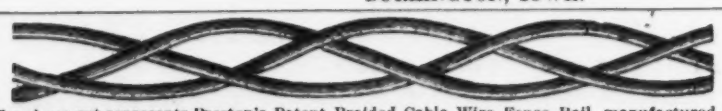

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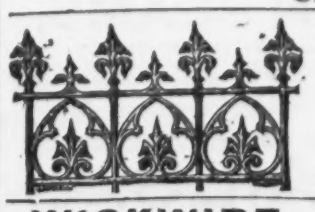

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Iron and Brass Founder.
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Chilled Cast Wire Dies a Specialty.
Any size or style made at short notice.

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For cutting off the ends of Bolts and Rivets, on carriages, wagons, harness, etc. Ask for them where you buy your hardware, or send for circular and price list.
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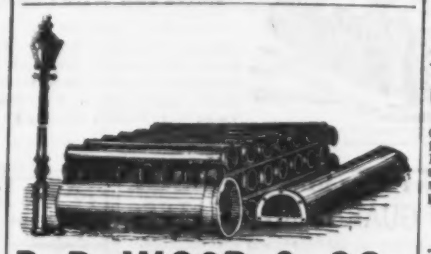

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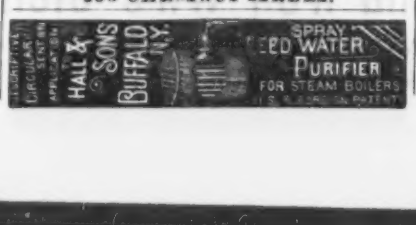

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The Automatic Freight Brake is essentially the same apparatus as the Automatic Brake for passenger cars, except that the various parts are so combined as to form practically one piece of mechanism, and is sold at a very low price. The saving in accidents, flat wheels, brakemen's wages and the increased speed possible with perfect safety, will repay the cost of its application within a very short time.
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The WESTINGHOUSE BRAKE is now fitted to upward of
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Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.
Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 150.
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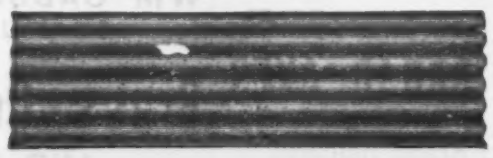
All Sizes of Corrugation from 1¼ to 5 inches.



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Manufacture and have always in stock
ROLLED IRON BEAMS,
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PATERSON, N. J.
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CUT NAILS.
Hot Pressed Nuts, Bolts, Washers, &c.
DOVER IRON CO.'S
BOILER RIVETS,
Boiler Brace Jaws, Socket Bolts, &c.
FULLER BROTHERS & CO.,
139 Greenwich Street, New York.

LATEST LEGAL DECISIONS.

MARKET VALUE OF STOCK—REPORTS OF SALES.

In an action to recover damages for the coversion of some mining stock, the only proofs to show the value of the stock were the published reports of sales of mining stocks in the San Francisco Stock Exchange Board. The defendant objected to the admission of these reports as evidence of price of the stock, and his objection was sustained. The plaintiff recovered only nominal damages and he carried the case—Vogt *vs.* Cope—to the Supreme Court of California, where the judgment was affirmed. Judge Ross, in the opinion, said: "There was nothing to show, or tending to show, how or in what manner, the 'reports of sales' were made up; where the information they contained was obtained, or whether the quotations of prices made were derived from actual sales or otherwise. In the absence of some such proof, the 'reports of sales' offered by the plaintiff were incompetent. It would have been a very simple matter to have the value of the stock, but, simple as it was, the proof was not given."

FIRE INSURANCE—SUIT TO BE BROUGHT IN 12 MONTHS—PROOFS OF LOSS.

A fire policy provided: "Payment of losses shall be due in 60 days after the proofs required by this company shall have been received at their office," &c. * * * "No suit or action of any kind against this company, for the recovery of any claim by virtue of this policy, shall be sustainable in any court, unless such suit or action shall be commenced against this company within the term of 12 months next after any loss or damage shall occur." The fire occurred on September 14, 1881, and the proofs of loss were duly filed. The action was brought on November 11, 1882. The defense was set up that the action was barred by the limitation of the policy, but the plaintiff claimed that the year did not expire before November 14, 1882, as he had 60 days in which to prove his loss. The trial court ruled in favor of the company, and the case—Chambers *vs.* Atlas Insurance Company—was taken to the Supreme Court of Errors of Connecticut, where the judgment below was sustained. Judge Pardee, in the opinion, said: "The limitation is lawful and reasonable. In words in common use and of plain meaning, an event is referred to as a starting point—that is, the destruction of or injury to the plaintiff's property by fire. The contract keeps the day upon which a fire shall occur entirely distinct from the day upon which the right to sue for indemnity accrues; each is stated in plain and appropriate language."

PARTNERSHIP—TAXATION—SUING ONE PARTNER.

A county treasurer sued one member of a firm for the taxes due on the partnership property, and the defense was set up that all of the partners were necessary parties as defendants. The defense was overruled, and the case—Bower *vs.* Crow—was carried to the Supreme Court of Nebraska, where the judgement was reversed. Judge Reese, in the opinion, said: "Contracts made by partners with third persons are joint, and all must be joined in an action upon it. Implied obligations are joint when the facts for which the promise is implied apply equally to more than one. Partnership debts and debts of joint-stock companies are always joint. The obligation being joint, it denotes but a single indivisible claim, and so all the obligors constitute, as it were, one person owing a single debt, and no one owes any part of it. This action is defective, as all the partners were not made defendants, and the judgment must be reversed."

SALE OF BUSINESS AND STOCK—FALSE REPRESENTATIONS.

H. bought the business and stock of C. & Co. for the sum of $4500, paying $2500 in cash, and giving notes for $2000. In the action brought upon these notes, H. pleaded a set-off of $2000, on the ground of false representation, C. & Co. having falsely stated to him that the business returned a net profit of $600 a month, which was the main inducement for the purchase. The plaintiff demurred to the answer, on the ground that it did not state any sufficient defense, and the trial court decided in his favor. The defendant took the case—Hekfort *vs.* Cramer—to the Supreme Court of Colorado, when the judgment was reversed. Chief Justice Beck, in the opinion, said: "1. Being a private business enterprise, the facts whether or not it was a profitable enterprise, and to what extent, were particularly within the knowledge of the plaintiff and the partners whom he represented. The defendant is not presumed to have had any knowledge on the subject, except as obtained from the owners. He relied upon the statements made to him on their behalf, as he had a right to do, and dealt with them as with honest men. Instead of getting what he contracted for—an established and remunerative business—he found himself encumbered with an enterprise that yielded no profit whatever, and with a property considerable portion of which was useless for any other purpose than this business for which he purchased it. The defendant was entirely justified in refusing to pay the notes, and he can plead his damages as a set-off to them. 2. It is not a valid objection that the amount did not separate the value of the stock and the value of the business. The contract was an entirety, and the sum to be paid on the consideration for the whole property, which included the good-will of the business, and the defendant was entitled to the benefit of the contract. It is well-settled that the good-will of a business may have a property value, and form the subject matter of contract and sale. 3. The rule for the estimation of damages resulting from fraudulent representations in the sale of real and personal property is the same. It is to ascertain the difference between the value of the property as it actually existed on the day of sale, and its value as it was represented to be."

COLLECTION—OWNERSHIP OF CHECKS, NOTES AND DRAFTS.

V. deposited with the Indianapolis Banking Company a promissory note for collection. The note was payable in St. Louis, and the Banking Company sent it on with

A. H. McNEAL,

BURLINGTON, N J.

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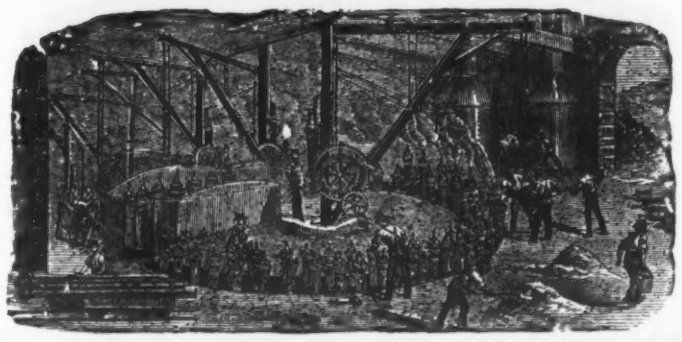

General Foundry Work.

CAST IRON PIPES,

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., Limited,

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MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Muley, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

☞ All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequaled for surface finish and exactness of gauge.

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For Shafting, Spindles, Rollers, &c., &c.

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"Iron Center" Cast Plow Steel.
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Finished Rolling Plow Coulters, with Patent Screw Hubs Agricultural Steel cut to any pattern desired. [attached. Steel Forgings made to order.

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CRUCIBLE AND OPEN-HEARTH STEEL.

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CHILLED RAILROAD WHEELS

For every kind of service, including *Street, Mine and Lumber Tramways.* Wheels furnished in rough-bored or on axles. Chilled Castings made to order.

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Steel Rails, Frogs, Crossings and Switches.

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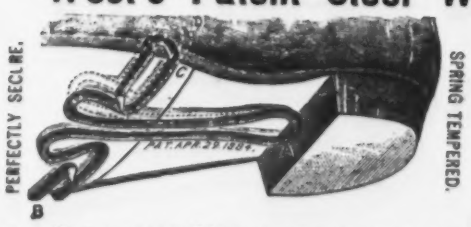
West's Patent Steel Wire Ice Creepers.

PERFECTLY SECURE.



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NO SCREWS OR STRAPS REQUIRED.

Easily attached to either Shoes or Rubbers.

C. F. WEST CO.,

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Satisfaction guaranteed if used according to directions, viz.: Push part "A" *firmly* into the heel, with clip "B" on outer edge of shoe, then spring clip "C" into position. In taking off, spring open clip "C" same as dotted line "D."

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Send for samples and prices.

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AT SAME PRICES AS IRON WASHERS.

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QUALITY EQUAL TO STEEL FORGINGS.

Can be Bent, Welded or Forged.

STEEL INGOTS, Best Stock, Furnished to Order.

Ship Patterns direct to Thurlow, Pa., via. P. W. & B. R. R., or via. P. & R. R. R.

We are prepared to make all kinds of Heavy or Medium Weight

STEEL CASTINGS

FROM

OPEN HEARTH METAL.

We wish to give special attention to making **Cast Steel Rolls** of all sizes, **Mill Gearing** wherever Cast Steel is suitable. Also **Cranks, Cross Heads, Shafts,** &c., for Steam and Blowing Engine construction.

Being desirous of securing a share of public patronage, we will endeavor to make our product equal in quality to any in the market.

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THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel.

Parts Interchangeable

SIMPLE IN CONSTRUCTION.

EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by

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MANUFACTURERS OF

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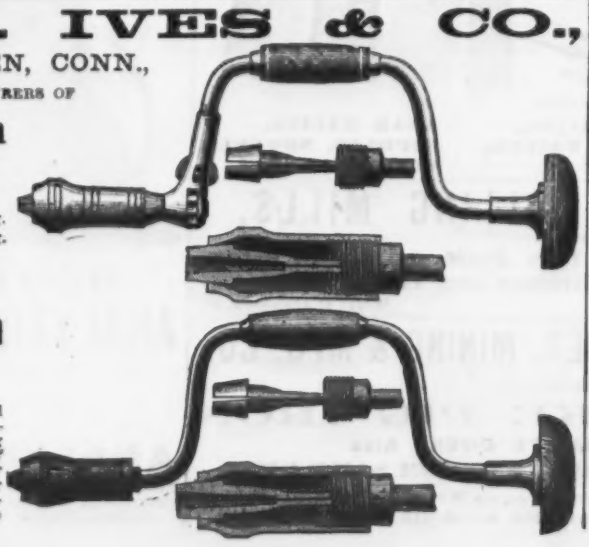
RATCHET BRACE.

No. 120.....10-inch Swing.
No. 121..... 8 inch Swing.



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BIT BRACE.

This Bit Brace is constructed upon an entirely new principle. Its socket and grasping jaws are one *solid piece of metal.* Not a pin, spring or fastening to get misplaced or out of order. STRONG, DURABLE and CHEAP, it is the PEOPLE'S BRACE.

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Hog and Pig Ringers

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RINGS.

DAILY PRODUCTION OF RINGS, 75,000.

Parties buying and selling Ringers with two or more grooves in jaw, other than those labeled Blair's Patent, March 17, 1874, are infringing, and will be held responsible for damages.

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LAWSON NON-EXPLOSIVE BOILER.

This is the only steam boiler ever devised in strict compliance with the demands of natural laws. It gives complete immunity against explosions, delivers dry steam, prevents all incrustation and deposit on the bottom plates, affords safety with high pressure, and secures great economy. The invention is applicable to every style of boiler, and can be readily applied, internally or externally, to new or old boilers. Licenses granted on liberal terms to manufacturers. Send for description.

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LARGEST LINE OF

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MADE BY ANY HOUSE.

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STEAM HEATING BY DIRECT RADIATION in all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. Noiseless Vertical Engines, Hydrants, Fire Plugs, &c.

FRAS. B. BANNAN,
Potteville, Schuylkill Co., Pa.

instructions to "collect and credit" it to their account. There was no knowledge, whatever, in the collecting bank that V. had any interest in the note. The balance against the Indianapolis Banking Company was and remains greater than the amount of the note. V. sued the St. Louis bank for the sum collected, in the United States Circuit Court for the Eastern District of Missouri, and the case—Vincent *vs.* State Savings Association—was decided against him. Judge Brewer in the opinion said: "The Indiana bank was the apparent owner of the paper—made so by the unrestricted indorsement of the plaintiff. It forwarded the paper to the defendant for collection and credit. The defendant had no notice of the plaintiff's title, or reason to suppose that the Indiana bank was not the owner. These banks had had running accounts for years, the balance sometimes favoring one and sometimes the other. The plaintiff, so far as any hardship is concerned, has no one but himself to blame. By a restricted indorsement he could have given notice to every one of his title. He chose to make the indorsement without restriction, and thus permitted the note to pass into the channels of trade as apparently the property of the Indiana bank. He trusted that bank, and must abide the consequences of his confidence."

PARTNERSHIP—FIRM MORTGAGE—EXISTING JUDGMENT AGAINST PARTNER.

M. & H. entered into partnership, and on the same day bought land to build a foundry upon for the purposes of their business. The title was taken in the individual names of both members of the firm. Some years prior a judgment had been docketed against H., and about a year after the firm was created the judgment creditor levied a tax on H.'s interest in this land, and the sheriff advertised it and sold it, and gave his deed to the creditor for it. A month later the owner became embarrassed, and, to raise money to pay his debts, borrowed $3500 from M., and gave a mortgage on this land to secure the loan. This mortgage was foreclosed, and the creditor holding the sheriff's deed claimed the one-half ownership, H.'s portion. It was shown that the land was bought with money contributed equally by the partners, and that this money was part of the sum agreed upon as the capital of the firm. In this case—Morton *vs.* Higgins—in the Court of Chancery of New Jersey, the claim of the creditor was rejected. Vice-Chancellor Van Fleet, in the opinion, said: "No one can, by a conveyance from one partner, acquire a valid title to land bought with partnership money and held for partnership purposes, unless he is a purchaser for value in good faith, without notice of the title of the firm. The creditor might have sued out execution and proceeded to enforce his judgment at once on the acquisition of title by the copartners, and before debts were contracted by the firm, and prevented its being used as the basis of business or credit by the firm. But he stands aside until debts largely in excess of H.'s interest have been created by the partnership, and then attempts to satisfy his judgment. If he is allowed to do this he will withdraw one-half of the firm's assets from the reach of creditors, and compel the other partner to bear the burden of the firm debts. It would be difficult to characterize such a result by any other term than a fraud in law."

Perverted Mechanical Talent.

A silver half-dollar was shown to Mr. J. F. Tandy, the coin expert of the Sub-Treasury, with the question: "Is that a counterfeit?" It was larger than the half-dollar coins in circulation, thinner, felt much lighter, and had a peculiar ring, unlike that of a genuine coin. Mr. Tandy, however, pronounced it to be the coinage of the United States Mint.

"I have one very much like it," he said, and, producing a little box filled with various counterfeit gold and silver coins, he picked out a half-dollar resembling that shown him. "When I got hold of this," he continued, "I was puzzled to account for its peculiarities. We finally sent it to the Mint and asked them to look at it. The superintendent wrote back that it was a genuine coin, but that it had been in the hands of counterfeiters. They had placed a piece of lead over this coin and hammered it until a perfect impression was made in the softer metal. In this process the half-dollar was spread out to its present size, and was made correspondingly thinner, as you see. As to the oddness of its ring, perhaps, the hammering changed the molecular construction of the metal, causing it to vibrate differently when rung. The difference in the size and thickness also would change its sound."

The little box from which Mr. Tandy produced his half-dollar contains bad coins detected at the Sub-Treasury from time to time. There are counterfeits of various characters and various pieces, from a silver quarter to a gold double-eagle. The bad pieces best calculated to deceive are those in which a genuine coin has been altered or tampered with, leaving the impression of the die intact. Among them is a Mexican silver dollar the face of which was in some way sliced off, and the body of the coin all dug out until nothing but a shell remained. Into this a little cake of lead was nicely fitted to give it weight, and the thin disk of silver being replaced like the lid on a blacking box, the coin was ready for circulation. The result of all this work was only the value of the silver extracted from the coin, and, unless the operator had fine machinery and drove a trade in the wholesale line, it is difficult to see how he made laborer's wages.

There are in the collection some American silver dollars the edges of which indicate that a deep furrow has been plowed out in a lathe, the gutter thus made being then filled up with white metal. There are a number of out-and-out counterfeit quarters and half-dollars, most of them poor in appearance and very light in weight. Some gold-dollar pieces are better made, and would be taken by most persons without hesitation. The gem of the collection, however is a 20-dollar gold piece, which it is difficult to believe is not all it should be. This, Mr. Tandy explains, has been treated in the same manner as the Mexican dollar already described. The impression on both sides is genuine, but the gold has been scooped and its place filled with base metal. The coin came over in a shipment of double-eagles from London. A number like it were caught at one time or another. On cutting them up it was found that the shell contains $6 worth of gold. The operators therefore got $14 out of every coin so treated which they succeeded in passing.

Electricity Displacing Watchmen.

Application has been made by Pittsburgh parties for a charter for a corporation whose projectors claim will control a system for the prevention and detection of burglaries and fires, which will not only throw all the private watchmen in the two cities out of employment, but make Pittsburgh and Allegheny an exceedingly unhealthy place for law breakers generally. The corporation is to be known as the Stern Electric Alarm Company. As set forth in its charter, its objects are the prevention and punishment of theft and willful injury to property. The inventor is W. A. Stern, who for many years was associated with Edison. The company was organized several months ago, and by the first of next month expects to be ready for business.

The manner in which the plans of burglars are to be frustrated is thus explained by Mr. Stern: "Central stations will be established in Pittsburgh, Allegheny and the East End, and at each of these a good force of careful and experienced officers will be located night and day. Banks, business houses and private residences will be connected with these stations by wire, and will be so completely protected that even persons who have a right to do so cannot enter without the central station being notified. The plan is very simple. Windows and doors will be supplied with simple electric appliances in such a manner that their presence cannot be detected. The instant an attempt is made to open a door or raise a window a gong in the central office will ring, and an annunciator similar to those used in hotels will indicate the number of the building entered. For bank vaults or other places requiring extra precautions the doors or panels will be lined with electric wires so fine that a coil weighing 1 pound is 3 miles long. These wires will be so close together that, even if their presence or location is known, entrance cannot be effected without breaking or disturbing one or more of the wires, and so sounding the gong in the central office. One or more men will answer each alarm. The stations may be so close to the subscribers that any one can be reached in three minutes. The intruders will not know that an alarm has been sent in, and very few can do much in three minutes."

The electric current is also to be utilized in the detection of fires. Ceilings and other portions of buildings will be studded with thermostats—brass instruments about the length and thickness of a man's finger. These are so susceptible to heat that a match held for a quarter of a second within 6 inches of a thermostat will cause it to ring a gong miles distant. The fire-alarms will be taken on a separate gong from that recording the visits of trespassers. The fire department will be immediately notified, and in addition trained men will be sent to the place.

The company expects to begin business with 200 subscribers. Joseph T. Speer is president and Heber McDowell general inspector. C. F. McKenna, R. P. Duff, D. H. Gilkinson and P. M. King are among the directors. These gentlemen all claim that the Stern system has been thoroughly tested, and that there is no doubt of its practicability. The cost of the apparatus, they say, will average less than is now paid for private watchmen.

Moisture in Coal.

Messrs. Taws & Hartman, the well-known blast furnace engineers, furnish the following note on the use of anthracite coal to the *Bulletin* of the American Iron and Steel Association:

In a paper read at the Philadelphia meeting of the American Institute of Mining Engineers, in September, 1884, Mr. A. B. Emmons points out the fact of anthracite coal taking up water during a long spell of wet weather. This will account for one of the variations in running anthracite furnaces. Between the extremes of dry and wet weather anthracite coal will take up 2 per cent. of moisture, as shown by his analysis. The filler weighs his unit of coal for the furnace correctly, but he makes no allowance for the moisture taken up during wet weather. The furnace then loses 2 per cent. of its heating and reducing power. In addition to the above moisture the moisture in the blast absorbs heat in front of the tuyeres. A furnace using 10,000 feet of air per minute on a dry day and 10,000 feet on an extremely wet day will require 4692 pounds of coal additional to counteract the moisture at the tuyeres, and will require 4002 pounds of coal to make up for the water in the coal. This extra 4002 pounds of coal should be added at once, so that there may be no loss in the reducing power of the furnace. To make up the deficiency caused by the moisture in the blast the heat in the blast can be raised to 1300°. The extra moisture in the blast increases its specific heat, which would in time rob the stove of its heat if additional gas is not used, and thereby poorer iron will be made. When a furnace runs through a wet spell without change it is simply due to the excess of heat stored up in the furnace. If the wet spell is long continued poorer iron results. During hot, dry weather the revolutions must be increased to give the furnace the same amount of oxygen. Mr. Emmons has done well in calling attention to this absorption of water by anthracite coal.

It is reported that during the summer some very fine copper veins have been struck on the property of the Kafveltorps Company, in Orebro Lan, Sweden. Not long ago a block of nearly pure copper, 16 cubic feet in size, was brought up from one of the mines. It will be exhibited at the exhibition in Stockholm in 1886.

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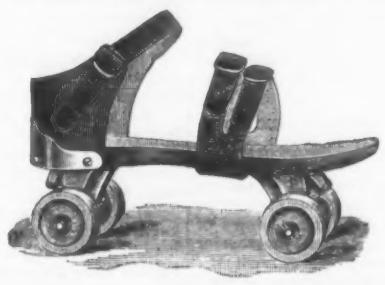

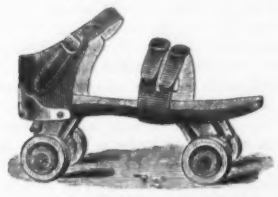

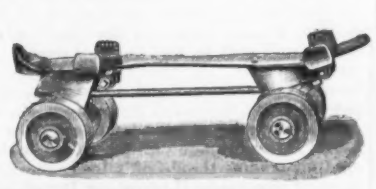

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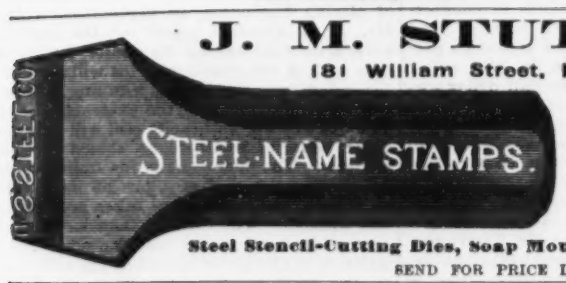

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Handsaw (Double-Ender),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
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Hook-Tooth,
Knife,
Knife Blunt,
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Mill,
Mill Blunt,
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Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
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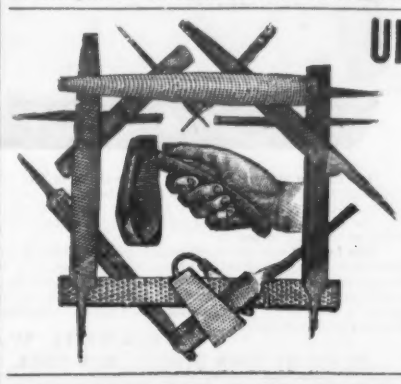

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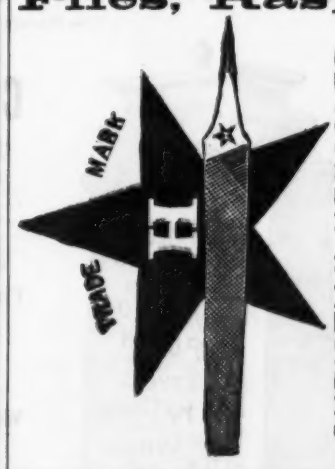

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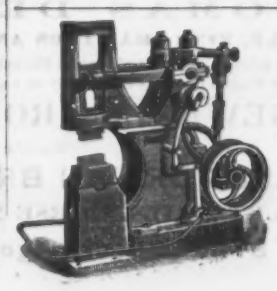

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(*Continued from page* 1.)

upper disk are surrounded by a case made of hard rubber, and the space filled with eider down.

In experimenting, ice-water is generally used to reduce the temperature of the disks to nearly the freezing point of water, and then the friction is noted at each degree of the rise in temperature due to the heat of friction. A tube of thin copper, closed at the bottom, reaches through to the bottom of the disk, and a thermometer with its bulb placed within this tube indicates the temperature of the frictional surface. A tube leading through the upper disk conducts the lubricant under trial to the recess in the middle of the lower disk. The upper end of this tube, being of glass, indicates the supply and rate of feeding of the oil. As the friction of a journal depends quite largely upon the method of lubrication, uniformity in the manner of supply is of the utmost importance. Over the upper disk, a yoke with four arms rests upon four columns which extend through the upper disk to the middle of the frictional surfaces, these columns being cast as a portion of the disk. In the center of this yoke is a hole with hemispherical bottom. The lower end of the upper spindle is round, and, fitting into this hole, makes a ball-and-socket joint. This construction transmits the stress due to the weight applied upon the spindle to four points in the middle line of the frictional surfaces, and the strains due to excessive loads will not distort the disks so as to interfere with the uniformity of the thickness of the film of oil between the surfaces, while the ball-and-socket joint allows the surfaces to meet without any cramp or binding due to imperfection or wear which would prevent the surfaces from revolving in a true plane.

The axes of the upper and lower spindle do not coincide, but are on parallel lines about ⅛ inch from each other. This prevents the surfaces from wearing in rings, because the same points are not continuously brought in contact with each other. A slight countersink in the top of the upper spindle receives the center point in the middle of a beam which sustains the weighted platform beneath the table. The weight pressing the disks together is thus exerted along the axis of the upper spindle. It has been found that it is essential to obtain the pressure by the direct application of weight, for any plan of using weighted levers or springs upon a disk requires the use of an additional point of support whose friction introduces an error which cannot be measured. The upper disk with its load must be free to turn slightly in the easiest possible manner, with slight changes in the friction. The use of knife-edges to support the upper spindle was out of the question, because it must be sustained in all directions.

Instead of holding it in ordinary journals, the friction of motion was substituted for the friction of repose by placing two pulleys, whose arbors were long sleeves, at the two points of support, and running the spindle through the middle of these pulleys. The torsional effect due to the friction of the pulleys against the spindle was nullified by revolving them in reverse directions, so that the friction of motion due to 1000 revolutions per minute was substituted for the greater friction of repose. The friction of the two pulleys is so nearly in equilibrium that the spindle could be sustained on a smooth surface without the friction of one pulley exceeding the other enough to turn the upper spindle—that is, the frictional couples at the supports neutralized each other.

At the left of the machine a counter records the number of revolutions made during any given time. A lever at the top controls a small friction clutch in order to stop or start the counter at any time during an experiment. Under certain conditions the friction varies so rapidly that the dynamometer measuring it must be instantaneous and automatic in its action. The dynamometer shown on the right hand of the machine consists of a mechanism of segments and pinions for multiplying the deflection of a steel bar, and indicating the stress necessary to produce such deflection by the position of the hand on the dial. An arm which ends in the arc of a circle projects from the lower surface of the upper disk, and is connected to the dynamometer with a flexible brass tape. When the machine is in operation the lower disk is revolved, and tends to carry the upper disk around with it, by a force equal to the friction due to the lubricant between the disks.

The frictional resistance is obtained from the dynamometer by the principle of couples of equal moments. The reading on the dynamometer indicates the force of a couple whose arm is the length of the lever projecting from the upper disk, and this couple is opposed by a couple of equal moment, of which the dimensions of the frictional surface form the data for computing the arm, and the frictional resistance of the lubricant is the unknown quantity. When the friction is too great for the dynamometer, a pair of compound levers reduces the stress upon the steel bar in the dynamometer to one-fifth that of the whole pull of the frictional component, so that the capacity of the dynamometer is five times the amount marked upon the dial. The resistances at higher pressures are so much less than was anticipated that it has not been necessary thus far to use these reducing levers.

The coefficient of friction is deduced from the data of observation in the following manner: Let

P = Weight on disk, pounds.
R = Outer radius of frictional contact, feet.
r = Inner radius of frictional contact, feet.
p = Radius of any infinitesimal ring or band of the frictional surface, feet.
N = Number of revolutions per minute.
W = Reading on dynamometer, pounds.
l = Length of arm on upper disk, feet.
φ = Coefficient of friction.

Suppose that the annular surfaces of the disk be divided into an infinite number of elementary areas by equidistant circles and radial lines, then will

Width of band
$$= dp \quad \ldots\ldots (1)$$
Angle between two successive radial lines
$$= d\vartheta \quad \ldots\ldots (2)$$
Length of arc between two radii
$$= p\, d\vartheta \quad \ldots\ldots (3)$$
Elementary area
$$= p\, dp\, d\vartheta \quad \ldots\ldots (4)$$
Area of annulus
$$= \pi (R^2 - r^2) \quad \ldots\ldots (5)$$
Pressure per unit of area
$$= \frac{P}{\pi (R^2 - r^2)} \quad \ldots\ldots (6)$$
Pressure on elementary area
$$= \frac{P\, p\, dp\, d\vartheta}{\pi (R^2 - r^2)} \quad \ldots\ldots (7)$$
Friction on elementary area
$$= \frac{\varphi\, P\, p\, dp\, d\vartheta}{\pi (R^2 - r^2)} \quad \ldots\ldots (8)$$
Moment of friction on elementary area
$$= \frac{\varphi\, P\, p^2\, dp\, d\vartheta}{\pi (R^2 - r^2)} \quad \ldots\ldots (9)$$
Moment of friction on entire disk
$$= \frac{\varphi\, P}{\pi (R^2 - r^2)} \int_r^R \int_0^{2\pi} p^2\, dp\, d\vartheta \quad \ldots (10)$$
Integrating
$$= \frac{2\, \pi\, \varphi\, P}{\pi (R^2 - r^2)} \left\{ \frac{p^3}{3} \right\}_r^R \quad \ldots\ldots (11)$$
Substituting the limits
$$= \frac{2\, \varphi\, P\, (R^3 - r^3)}{3\, (R^2 - r^2)} \quad \ldots\ldots (12)$$
Work of friction per minute
$$= \frac{4\, \varphi\, \pi\, P\, N\, (R^3 - r^3)}{3\, (R^2 - r^2)} \quad \ldots\ldots (13)$$
Resistance of the dynanometer
$$= 2\, \pi\, l\, W\, N \quad \ldots\ldots (14)$$
The friction equals the resistance; hence,
$$\frac{4\, \varphi\, \pi\, P\, N\, (R^3 - r^3)}{2\, (R^2 - r^2)} = 2\, \pi\, l\, W\, N \quad \ldots (15)$$
$$\varphi = \frac{3\, W\, l\, (R^2 - r^2)}{2\, \pi\, (R^3 - r^3)} \quad \ldots\ldots (16)$$

This is not in a form convenient for continual use, and is susceptible of much simplification if the proper dimensions are used for the various parts in connection with the frictional surfaces and the dynanometer arm. It is also important for the sake of simplicity that the length of the line of mean area of the disk be 1 foot, so that the number of revolutions per minute is equivalent to the frictional velocity in feet per minute. For convenience, it was desirable that the area of the disks be 10 square inches.

If c = radius of circle whose circumference is 12 inches, then
$$2\, \pi\, c = 2 \quad \ldots\ldots (17)$$
$$c = \frac{12}{2\, \pi} = 1.909 \text{ inches} \quad \ldots\ldots (18)$$
Area within this circumference,
$$\pi\, c^2 = 11.46 \text{ square inches} \quad \ldots\ldots (19)$$

If this circumference divide the annulus of 10 square inches area into two equal parts, then the outer rim of the annulus will circumscribe an area of $11.46 + 5 = 16.46$ square inches. The radii corresponding to these circles are

$$R = \sqrt{\frac{A}{\pi}} = 2.289 \text{ inches} = .1907 \text{ feet} \quad \ldots (20)$$

$$r = \sqrt{\frac{a}{\pi}} = 1.434 \text{ inches} = .1195 \text{ feet} \quad \ldots (21)$$

$R^2 - r^2 = .0221$ feet; $R^3 - r^3 = .00523$ feet $\ldots\ldots (22)$

Substituting these values in Equation (16)
$$\varphi = \frac{5.338\, W\, l}{P} \quad \ldots\ldots (23)$$

This equation can be made still more simple if the length of the arm l is of such length that
$$\varphi = \frac{2\, W}{P} \quad \ldots\ldots (24)$$

Substituting this value of φ in Equation (23), we have $l = .3156$ feet $= .3787$ inches.

Generally the weight on the disks is referred to in pounds to the square inch; then
$$\varphi = \frac{W}{5\, p} \quad \ldots\ldots (25)$$

If the reducing levers which have been referred to are used, the reading on the dynanometer is one-fifth of the pull on the arm, and when the machine is used with this attachment
$$\varphi = \frac{W}{p} \quad \ldots\ldots (26)$$

* * * * * *

After the temperature of the disks has been reduced by a current of ice-water, the circulation of the water is stopped, the machine started, and the reading of the dynamometer noted at each degree of temperature. As the machine is generally used without the compound levers, the column of coefficient of friction is obtained by dividing the dynamometer reading by five times the pressure in pounds per square inch. * * *

As the temperature rises the increasing fluidity of the oil diminishes the friction within the limits of free lubrication. The resistance does not increase proportionately with the pressure, nor at a uniform rate. The lubricant, while separating the surfaces of a journal and protecting them from injury, also introduces the resistance of its own cohesion: and at small pressures the film of oil is thicker and the resistance due to viscosity of the oil exceeds that at high pressures when a smaller amount of oil lies between the surfaces. A film of the lubricant adheres to each of the frictional surfaces, and that portion which lies between these two films is pulled in one direction upon one side, and in the other direction upon the other side, and, as a resultant, the movement of this center layer is a rolling motion, whose rate of progression varies with the difference between the adhesion of oil between the two frictional surfaces.

Nearly five years ago I stated,* as a result of some early work on this subject, that "friction exists at the surface of the two disks between the film of oil acting as a washer and the particles of oil partially imbedded within the pores of the metal," and the result of all subsequent investigation has tended to confirm this view of the subject.

* * * * * *

In a general way, the coefficient of friction diminishes inversely with the pressure and directly with the fluidity of the oil, as

* "Transactions" New England Cotton Manufacturers' Association, Fifteenth Annual Meeting, p. 61.

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SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESS:—
E. M. REED."
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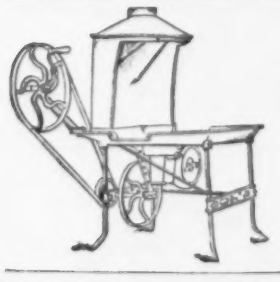

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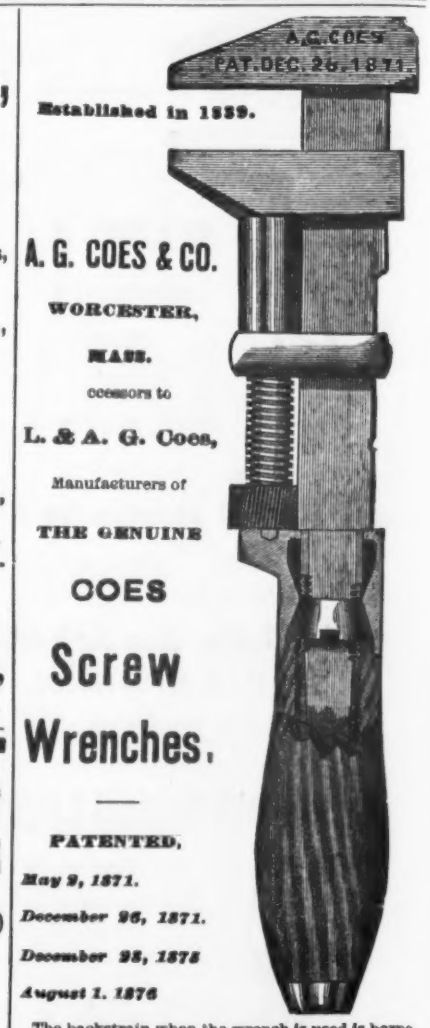

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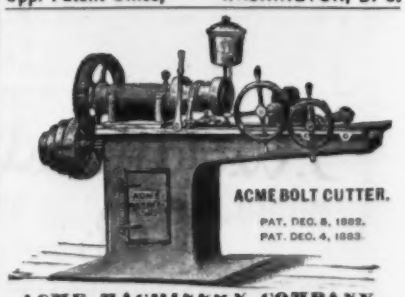

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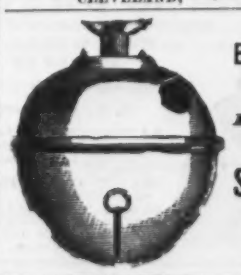

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indicated by the temperature, and that the rate of these differences diminishes with the increase of pressure. The reason for this is that the resistance due to the viscosity of oil is greater at low than at high temperature, and that with heavier pressures the film of oil is actually thinner, besides being relatively smaller in proportion to the pressure. On this account the frictional difference between lubricants is much less at high than at low pressure during continuous lubrication, although the differences in regard to endurance are more widely marked at high pressure. It is almost universally asserted to be a general principle that the coefficient of friction is independent of the pressure, regardles alike of the actual facts in the matter and of the limitations of Morin's "Experiments,"* which form the common source of authority on the subject.

The coefficient of friction between any two solids is accepted to be a constant ratio; but when a lubricating medium is interposed, then the frictional relation between these three substances becomes variable, according to the effect of temperature, pressure and velocity upon the lubricant, and the problem bears certain analogies to those of hydrodynamics relative to the efflux of a fluid through a narrow orifice. When the pressures are great, these variables form such a small ratio to the whole frictional resistance that they escape observation unless the measurements of friction are taken in an accurate manner. If the lubricant is not used, the variables disappear altogether, and then the coefficient of friction becomes reduced to a constant ratio. This latter class of friction is rarely considered, except for the friction of repose, in matters pertaining to the stability of structures, while the problems of mediate friction enter into the operation of the moving parts of every machine. This is not the place to enter into a criticism of the work of Morin, but it should be observed that his investigations were devoted to measurements of a sled upon tracks in the interests of the Ordnance Corps; and, although he made some experiments upon friction of oiled bearings, they were not subjected to the frictional conditions of lubricated journals under conditions analogous to those in machines.

In a letter† written March 15, 1879, Gen. A. Morin said (translation): "The results furnished by my experiments as to the relations between pressure, surface and speed, on the one hand, and sliding friction on the other, have always been regarded by myself, not as mathematical laws, but as close approximations to the truth within the limits of the data of the experiments themselves." Considerations of safety have fixed the minimum limit of the flashing point of a lubricating oil at 300° F., with a proportion of volatile matter not exceeding 5 per cent. thrown off by exposure to 140° F. for 12 consecutive hours. With the saving clause of proper limits of pressure a fluid oil offers less frictional resistance than a viscous one. Although data have shown that the coefficient of friction diminishes with the increase of fluidity, they do not warrant any extreme position in respect to the use of thin oils, except for light pressures, because, under all circumstances, the film of oil must be thick enough to keep the surfaces of a journal from actual metallic contact. In the severe work of heavy pressure a viscous oil must be used in order to retain its place upon the bearing surfaces in sufficient thickness to protect the inequalities upon the journal from colliding. In some places it has been found that the use of an extremely thin oil resulted in a diminution of the friction of the machines at the expense of more rapid wear of the journals. Such results are not apt to occur upon journals of light pressure, such as spindles, where a thin oil is used with good judgment.

An economy of oil may represent an extravagance in motive power; a liberal allowance of limpid oil may save motive power at the expense of the repair account, and, above all, the final result must show the greatest amount of lubrication for a dollar. Lubricants are wasted, not worn out by attrition, and it is of more importance to know how to use oil than what oil to use. The problem of lubrication seeks to know what combination of oil casks, coal pile and wear and tear will represent the fewest dollars, and in its broad sense it cannot be solved on any experimental basis, nor settled by a final dictum from any one source, but it will reach its solution through the practical experience of intelligent observation, aided by the resources of technical science.

Failure of a Great War Ship.—A London letter says: "The naval scare of a few weeks ago has been turned into disgust by the disclosure that the great and costly ship Agamemnon, a double-screw armored vessel, with guns of enormous caliber, can only be steered when the screws are not moving. Her rudder is absolutely useless when the two screws are in motion. The Agamemnon will accordingly have to be converted into a single-screw ship at a cost of $500,000. This discovery has redoubled the outcry against the impotent blundering of the Admiralty."

It is stated that in behalf of the industrial classes one of the French societies has recommended a suppression of all circular saws in workshops where practicable. The reasons given for this action are that such saws are extremely dangerous to workmen; they require much more force than other saws; they cut a broader line, and consequently produce more waste.

At Stuttgart, it is said, sand made from blast-furnace slag has recently been used largely for laying on the public promenades. It is found very clean, as it does not get muddy in wet weather, nor very dusty in dry weather. It is brought from the works at Wasseralfingen, some 50 miles away, and costs 4½ marks ($1.12) per cubic m. (1.3 cubic yards) at Stuttgart, as against 7 to 9 marks for good river sand.

* Nouvelles Expériences sur le Frottement, Faites à Metzen, 1831. Par Arthur Morin, Capitaine d'Artillerie. 128 pp., 4°. Plates.
Second Mémoire. 1832. 108 pp., 4°. Plates.
Troisième Mémoire. 1833. 142 pp., 4°. Plates.
† "Transactions" Institution Mechanical Engineers of Great Britain, 1879, page 666.

Captain Eads's Ship Railway.

In a basement room in the Mutual Life Building, at Liberty and Nassau streets, New York, there is on exhibition a working model of the necessary apparatus for the Eads ship railway. Constructed in London at a cost of $10,000, it is a remarkable piece of work, and, with the accompanying explanation of E. L. Corthell, is of uncommon interest. It comprises a ship model about 6 feet in length; the pontoon and apparatus for lifting the ship and the carriage upon which it rests out of the water to a level with the permanent way; about 20 feet of the permanent way, and a floating turn-table which is to take the place of an ordinary curve. Owing to the length and rigidity of the carriage, no curve of a radius under 20 miles is possible. There will have to be in consequence five of these floating turn-tables where changes of direction greater than this allowable curvature are to be made. The wheels have double flanges and are attached to trucks, there being four wheels to the truck. Each truck receives its portion of the load, which will never exceed 20 tons, through the medium of four springs, which are each warranted to stand a load of 20 tons with a depression of 6 inches.

A liberal estimate places the cost of the entire enterprise at $45,000,000. A few of the difficulties which the designers had to overcome were the following: In the first place a ship, with or without its cargo, has the greater part of its weight amidships. It would be impossible to construct any carriage of sufficient rigidity to transmit this weight equally to the numerous wheels upon which it is to rest. Thus, the wheels at either end, under bow and stern, would bear but little of the burden, while those in the middle would be crushed. To counteract this the weight of the ship, while on the pontoon, is supported by a system of hydraulic jacks. Under each end of the ship there is one jack, while as the center is approached the number increases until there are five. The total area of the rams in each cross-row of jacks is the same, and, as they are all connected together and supplied by one force-pump, the pressure is equal upon each lineal foot of the carriage; according to the law of hydrostatics that pressure on a liquid is transmitted equally in all directions. A second difficulty is that it is impossible to locate exactly the center of gravity of a ship by calculation, and even after an accurate location of that point it would be difficult to bring it directly over the center of gravity of the pontoon. But if these two centers are not in the same vertical line the pontoon will tip when floated, the guides will bind and everything will come to a standstill. To prevent this there is an ingenious arrangement of hydraulic cylinders at the four corners of the pontoon, the ones at the diagonally opposite corners being connected, which will equalize the weight and absolutely compel the pontoon to preserve an erect position. After staying two weeks in this city the model will be removed to the New Orleans Exhibition.

In a recent interview on the subject of the prospects of his railway Captain Eads said: "Let me tell you that that railway will be constructed and in successful operation long before any vessels pass through Panama or Nicaragua. I have spent $100,000 in surveying the Isthmus of Tehuantepec, and a syndicate of 60 of the wealthiest men in this country are interested in it and represent more than sufficient capital to carry it through.

"The proposed railway will be about 134 miles in length. On the Atlantic side the route will begin on the Gulf of Mexico, and the Coalzacoalcos River will be utilized to Minatitlan, about 25 miles from the Gulf, in which the tide has a rise and fall of 18 inches only. From Minatitlan the route extends over an alluvial plain, on quitting which the line enters an undulating table land, presently following a succession of broad valleys, between which there are wide-spreading table lands, the whole forming an extensive interior basin, bordered on its eastern and western sides by irregular mountain ranges, spurs of the main Cordilleras. From this basin the line passes through a valley to the plains of Tarifa, which constitute the summit level of the line, 736 feet above low tide. Crossing these plains, the line reaches the pass of Tarifa, or Portillo. The line descends thence to the Pacific plains, reaching them by a uniform gradient, following a succession of valleys through the intervening hills. The maximum gradient required to reach the summit from either side is only 1 per cent., or 52.8 feet, per mile, but about two-thirds of the route will only require a gradient of about 20 feet per mile. On the Pacific side there is a choice of two harbors—namely, Salina Cruz and Boca Barra. In the latter the Pacific has a rise of only 5 feet."

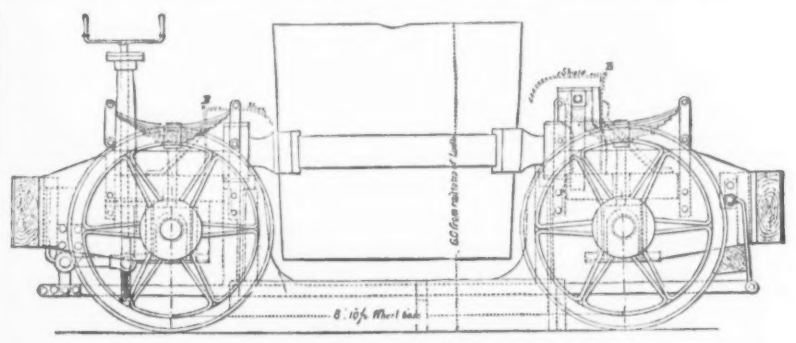
Lehigh Valley Cement Works.

An important industry in the vicinity of Allentown is the manufacture of cement, particularly the Portland cement. Only a few years have passed since attention was paid in this country to the manufacture of Portland cement, many of the early experiments having failed; but it is claimed that the cement now manufactured is equal to the best English and French brands imported to this country. The cement in England is made from the deposits of chalk and alluvial clays on the shores of the Thames and Medway, and is chemically a double silicate of lime and alumina. The Coplay Works are immediately on the line of the Lehigh Valley Railroad, and not far from Allentown, in which place the stock of the company is held. At the works 160 persons are employed in quarrying stone and working in the mill. The process followed at the works at Coplay is as follows: After the proportions of each bed are determined they are mixed together as they come from the quarry, and passed through the crusher and the mill and ground to a very fine powder; the whole is then thoroughly mixed dry and tempered through a pug mill with water; the product is then spread out on drying floors, and when stiff is cut into blocks the size of bricks; these, when dry, are placed in kilns, with alternate layers of coke,

METALLURGICAL NOTES.

An English Ladle Carriage.

The accompanying illustrations, showing two views of a ladle carriage which has been constructed from the designs of Mr. Thomas Wood, the chief engineer to the Ebbw Vale Steel, Iron and Coal Company, are taken from a recent number of London *Engineering*. These works cover a large extent of ground, the Victoria furnaces and the Ebbw Vale furnaces, both of which supply one steel plant, being over 1 mile apart. Although this gives a long distance over which the molten metal from the furnaces has to be carried, it is by no means unprecedented, the Barrow furnaces, for instance, being situated still further from the steel works they supply. Until a short time ago, however, the Ebbw Vale Company had their Sirhowy furnaces in blast. These are, or rather were, for now they are dismantled, situated 6 miles by rail from the converters they supplied at Ebbw Vale; consequently, the ladle containing the 10 tons of molten metal had to be brought this distance each



An English Ladle Carriage.—Fig. 1—Side View of Carriage.

time the converters were charged. In order to meet the exigencies of such a service the ladle carriage illustrated was designed by Mr. Wood. By means of the gearing of worm-wheel, rack and pinion, which are shown in Fig. 2, the ladle can be retained in the center of the carriage and kept upright for running, a clip which is easily knocked out of gear being fitted to retain it in the necessary position. When the ladle is in the required spot to enable the charge to be tipped into the runner which takes it to the converter, the loose wrought-iron handle A is slipped on to the square end of the worm-shaft, and by turning this the ladle is tipped, and at the same time travels on the rack from its position in the center of the carriage, one man being sufficient to perform the operation. The dotted lines at B, Fig. 1, represent a wrought-iron shield for protecting the tipping gear from splashes of metal, &c.

With the old cast-iron frame carriage the weight of the ladle and charge is practically carried by the two bearings on one side, as the ladle has to be overhung from the center of the carriage, in order that the metal may tip clear of the rails and into the well—supposing, of course, there are not conveniences for tipping direct into the converter. It will be seen that, in Mr. Wood's arrangement, when the ladle is in a vertical position it stands fairly in the middle of the

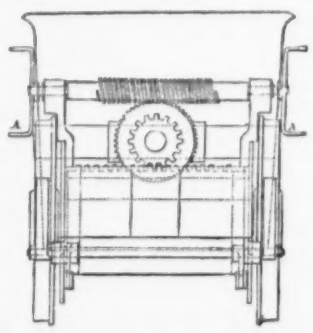


Fig. 2.—End View of Carriage.

carriage, but the action of tipping carries it to the side, so that the charge will clear the rails. This carriage has now been in work for about three years, and since its introduction there has not been the slightest hitch, even when running 10 tons of metal at a considerable speed over the 6 miles of line from the Sirhowy furnaces. Before the introduction of this ladle carriage considerable trouble had been experienced at Ebbw Vale with the original cast-iron frames. These, under the heavy duty put upon them, were continually breaking on the side which had to carry the weight, and this would entail the metal having to be tipped on the ground, so that it might be broken for recharging.

Improved Ore-Roasting Furnace.

The following account of a Westman kiln and the Davis-Colby ore-roaster which was erected in its stead at the Katahdin Iron Works, Maine, is taken from a paper read by Mr. George D. Colby, of Port Leyden, N. Y., before the United States Association of Charcoal Iron Workers, at their fifth annual meeting, recently held at St. Louis. The kiln was modified somewhat from the usual Swedish form to admit of the use of wood instead of furnace gas, the latter being the fuel generally used in Sweden. It was, when finished, 22 feet high, 4 feet inside diameter at top and 7 feet inside diameter at the bottom, had five drawing-out doors and 10 fire-arches. When completed the kiln was dried out, filled with ore, and fires started in each of the 10 fire-arches. The best of seasoned wood was used in the fire-arches and every possible effort made to thoroughly roast and desulphurize the ore, but without success. As the ore became heated it separated into small parts, which crushed compactly together by the weight of the ore above, and it became impossible for the heat to penetrate for more than a foot from the fire-arches. To that distance it was well roasted, but, when drawn out, the raw ore from the center of the kiln became mixed with that which was roasted, and, as much of the raw ore was very fine, it became impossible to separate it from the roasted, and considerable was charged into the blast furnace, carrying much sulphur with it. The ore was also often coated with free sulphur. Mr. Colby and Mr. O. W. Davis, Jr., treasurer of the Katahdin Iron Company, then added 35 feet to the hight of the chimney, hoping to overcome the difficulty by means of greater draft, but did not succeed, the disintegrating character of the ore defeating all their efforts. "So far," said Mr. Colby, "the Westman kiln had proved a decided failure, and we were about to abandon it when the idea of a central flue occurred to the writer, and a temporary one, made from a 16-inch wrought-iron pipe, was placed in the kiln. The result for a few days was very encouraging, but the wrought-iron flue would not stand the great heat, and was replaced by one of bricks. The kiln, however, was too small to admit of a central flue of sufficient size and strength for our purpose, if built of bricks, and after becoming convinced that we had at last found a way out of our difficulties, the Westman kiln was taken down and a Davis-Colby roaster erected in its stead. This roaster was constructed to admit of a good-sized central flue for the use of either gas or wood as fuel. The distance from the fire-arches to the central flue was 24 inches, so that in roasting the ore the heat passed through but 24 inches of it, and then was drawn directly into the central flue, carrying with it the liberated sulphur, thus preventing condensation of that element in the upper part of the roaster. The hight of this roaster was the same as the Westman, viz., 22 feet. The blast furnace was put on ore calcined by this roaster, and at once showed a very marked improvement in its working; the product was increased fully 33 per cent., and the consumption of fuel decreased an equal amount. The roaster has been in successful operation for four years, requiring no repairs, and roasting all the ores used in the blast furnace during that time. Concerning the improvement in the quality of the iron affected by the use of this roaster, which simply thoroughly roasted the ore, it will be sufficient to say that the product of the furnace has found ready sale as a first-class car-wheel and malleable iron."

Improved Method of Casting Ingots.

An invention has recently been brought out in England for the elimination of gases from steel ingots as rapidly as possible after the liquid steel is run into the ingot molds. This object is effected by leaving the upper surface of the ingot mold open, and at the same time so shaping the ingots and ingot molds that this upper surface is the largest, or nearly the largest, surface of the ingot, which forms a comparatively thin layer of steel as distinguished from a deep layer of steel, which is the ordinary form of the ingots of Siemens-Martin, open-hearth and Bessemer steel. The effect of casting the steel in an ingot of shallow depth and with a large exposed upper surface, it is said, is that the gases carried into the ingot mold with the liquid steel have but a short distance to rise before reaching the upper surface of the ingot and escaping from it while in a liquid state, so that the steel solidifies practically free from those gases. A further advantage claimed for this invention is that the process or operation of hammering ingots preparatory to rolling them into plates or bars is dispensed with, as the ingots constructed according to this invention merely require to be reheated, when they are ready for being passed through the rolling mill.

Influence of Copper on Steel.

M. Choubley, says an exchange, has confirmed the observations made by Wasum on the influence of copper in steel upon its rolling qualities. Wasum found that .862 per cent. of copper did not in the absence of sulphur produce red-shortness, and Choubley, in the *Comptes Rendus de la Société de l'Industrie Minérale*, adds that even 1 per cent. of copper does not produce it. He melted 15 kg. of steel scrap in a crucible with 150 grains of copper, the metal produced having the following composition: Carbon, .495; manganese, .460; silicon, .150; phosphorus, .069; sulphur, .040, and copper, .960 per cent. This steel did not show the slightest trace of red-shortness. Noting that Wasum's tests were conducted with steel low in phosphorus, Choubley made some additional experiments to test the question what influence phosphorus and copper have. In order to see whether the steel was red-short, a small bar was nicked and then heated to dark cherry-red. The time of the fracture and its appearance would reveal any tendency to red-shortness; none was observed in any of the bars analyzed. The steel rolled well. It is safe to conclude, therefore, that steel with .50 carbon, from .40 to .50 manganese, .20 phosphorus and .50 copper does not exhibit red-shortness.

To hang a grindstone on its axle to keep it from wobbling from side to side requires great skill. The hole should be at least ⅛ or ½ inch larger than the axle, and both axle and hole square; then make double wedges for each of the four sides of the square, all alike and thin enough so that one wedge from each side will reach clear through the hole. Drive the wedges from each side. If the hole through the stone is true the wedges will tighten the stone true; if the hole is not at right angle to the plane of the stone it must be made so, or the wedge corresponding must be altered in the taper to meet the irregularity in the hole.

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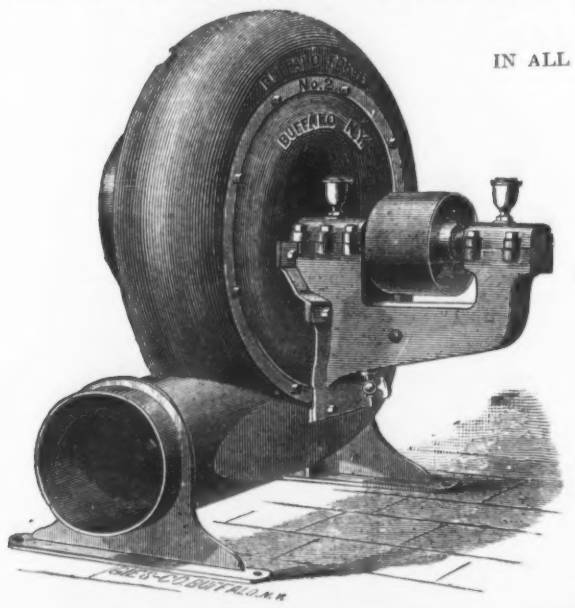

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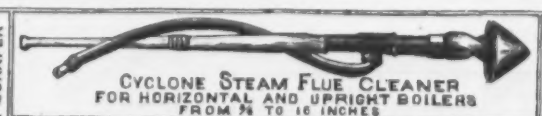

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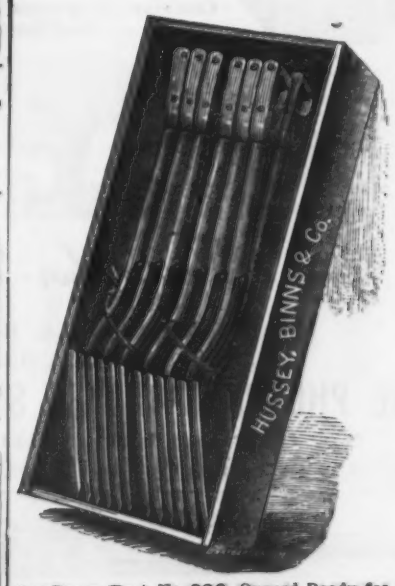

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and burnt; the clinker is then carefully selected, the pulverulent scarified and the underburnt taken out; it is then ground and conveyed to the bins, where it is left a few weeks to sweat and then cool. The steam-power of these works is sufficient to grind the production of the kilns and to work the iron conveyers which carry the ground cement to all parts of the storehouses. The same power also hoists the stone from the quarry to the kilns for anchor cement and to the crushers for the Portland. There are several other cement works in the immediate vicinity, among them being Leslie & Trinkel's, of Philadelphia.

Blocks and Pulleys.

The place was a loft in South street, New York, near Catharine Ferry; the speaker an old man whose rugged features and harsh skin betrayed years of hard work before the mast. Blocks and pulleys were everywhere, from the small galvanized-iron pulley used on canoes and catboats to unwieldly wooden blocks, a foot in diameter, with five sheaves.

"The trade is played out," the old block-maker said, "and I might just as well get out of it. Machinery and new-fangled inventions have run it into the ground. In the old days, 50 years ago, all blocks were hand-made and of good wood. It may seem a simple thing to make one. It's only a shell, a sheave and a pin, but it takes long practice and a good eye and hand to turn one out shipshape. They're made out of oak, ash and lignumvitæ, and to keep out moisture we either soak them in hot boiled oil, melted wax or paraffine, or else varnish them with oil, or pitch, or varnish. Made this way they'll last for years and years. On the Baltic there were two I made that lasted 30 years, and they were as good the day the old ship was broken up as they were the day they were put on. The best blocks in the old days were made here and in England. Block-makers were few in number and got first-rate wages. Many's the lot I've packed here in this city in the 40's and sent to different parts of the world.

"The first change was when they began to cast iron pulleys and blocks. Of course we had brass ones before that, but they were very dear and were chiefly used by swells who had yachts and on men-of-war. The iron used to rust through, and so they didn't get ahead very fast, even when they were japanned or painted. Then they galvanized them; dipped them in a caldron of melted zinc, I believe. That stopped the rust and made them last almost as long as wooden ones. The galvanized only cost a third or a half of the wooden ones, and pretty soon began to drive out these from the market. Still they were only good in small sizes, because the big ones were too heavy, and so we block-makers didn't suffer much. After that, though, some Yankee made a machine that turned them out just like bullets from a mold, and then the trade began to die out. The cost of a block was partly the wood, but mostly the labor. Now the machine turns out three where a block-maker does one. I don't think they are as good as ours, but they are cheaper and handsomer, and that settles it."

"Are many used nowadays?"

"Hundreds of thousands. The Baltic used 1500, and carried 500 more; the Northern Light, 1600, and carried 500 also; ocean steamers are good for 500 apiece; men-of-war from 750 to 2500. Safe men, hoists, telegraph men and builders are always buying them. There must be 2,000,000 or more made every year. But these differential pulleys have done the most harm. These used to be iron, but now, I'm told, they're all cast steel. You see, in heavy lifting blocks break or get worn out very fast; but with these differentials they seldom break. Chain, instead of rope, is used, and they are easier worked and I guess a good deal more serviceable in the long run. An iron man the other day told me there were more than 200,000 in use to-day, and that means a cutting into our trade of just that many wooden blocks a year. Why, the other day in walking from the Bridge to Dey street I took notice and counted the differentials I saw. There were 17, and I don't know how many I didn't see. One differential was lifting rolls of paper into a newspaper office. That, in the old days, would have taken three sheave blocks, and at least one would have given out every 10 months. Up the street they've got a heavy differential that lifts boilers and machinery. The foreman there said it would lift 25 tons; in my time he would have used a four or five sheave block."

An Interview With a Lock Expert.

"Locks? Locks won't keep burglars out. Why, I can open any kind of lock that has ever been invented, without key or combination." The speaker was a close shaved, clean-cut, penetrating-looking man. He stood in a locksmith's shop on Four-and-One-Half street, Washington, dangling the dial of a combination lock on the end of a bent wire.

"They open if he looks at 'em," said a youth, who stood by, interestedly examining the bits of broken lock, old keys, drills and odds and ends of wire, brass and steel which were scattered about the shop. The sign in front of the door read, "Practical Locksmith and Safe-Opener."

"Do you make a practice of breaking open safes?" asked the interviewer.

"I open safes when nobody else can," replied the smith, giving the scribe a keen, inquiring look which might have opened him had he been a lock. "That is, I open safes when the locks are out of order or the combinations lost. Sometimes a man will oil the lock of his safe and it gets gummed up so that the tumblers won't work and he can't get it open. Some men are forgetful and lose their combination. Safes are sold at sheriff's sale sometimes, and the owner, being mad, won't give up the combination. When anything of that kind happens they send for me."

"Do you blow them open?"

"No. If the lock is broken so that it won't work I drill a little hole alongside the dial, and pick the lock with a small bit of wire. If the lock is all right, only the combination is lost, I go to work to find it and don't deface the safe at all. It takes me from three seconds to six hours to open a safe, according to the kind and the method I employ."

"But how can you find the combination? Does it not take a long time?"

"By testing. As to the time, it depends upon circumstances. If I know the man who set the combination I can find it in a very few minutes. If I don't, it takes longer. You see, I study the character of the man, and if I know him pretty well I can strike his combination through his character. When a stranger comes to me to say he has lost his combination I make a study of him, and in nine cases out of ten I can hit it the second or third trial. But if he did not set the combination himself it is more difficult. Then I study the lock instead of the man, and I am sure to get it open in a few hours. Oh, no! It wouldn't do to tell you how. Safe-openers are dangerous in a community. They are always watched by the police. They keep an eye on me all the time. I have them trying my door all hours of the night, and there's generally one somewhere around. No, I couldn't teach you to open safes. But you might not find it easy to learn. There is a kind of association between me and locks—an understanding, as it were. We have the same way of thinking."

"Could you open a burglar-proof time lock?" asked the scribe.

"I can open in five or six hours the best lock that was ever made. These little office safes I wouldn't put that much time on. They don't pay enough. I just take a hammer and break the knob off, and can get into the safe in about three seconds."

"What do you get for opening a safe?"

"For a little three-second safe I get $10. For large safes, like they have in banks and brokers' offices, and where they don't want the lock injured, I get $250."

"Could you open the great safe in the United States Treasury?"

"Easily. I could get rid of the time lock and everything in six or seven hours, and wouldn't make any particular fuss about it, either. No safe was ever made but it had some weak point, known to the maker, so he could get into it in case the lock should fail to respond. If there wasn't, they would have to break the concern all to pieces if the lock broke. Now, I know where to find these weak places. I can strike within ¼ inch of it every time. It is generally covered over by a thin sheet of steel or boiler iron, and by cutting away a block 3 or 4 inches, which is easily done, I could drill into the best safe that has ever been made. It would not be any trouble for burglars to get into the Treasury safe if they understood locks as I do."

"Has your knowledge of locks ever got you into any trouble with the police?

"No, not seriously, though, as I say, they always watch me. Down in Oil City, though, I created quite an alarm one night, and came near being captured as a burglar. Some fellows got to tampering with the safe in a large hardware store there, and somehow got the combination changed so that no one knew how to open it. The proprietor sent for me, and I told him I could open it, but as I was quite busy I should have to wait until evening. I closed my shop a little after dark and went over to the store and got to work on the job. I had been working a couple of hours, when somebody banged at the door and called for me to surrender without resistance if I did not want to be shot. The proprietor was, fortunately, in the store at the time and opened the door. There was a squad of police armed and the house was completely surrounded, so I could not escape. The patrolman had seen me at work on the safe and gone off and roused the town, and the whole police force had been called out to surround the building. The proprietor explained, and I wet on with my job."

"But locks don't do much good against experts," he continued. "A gang of burglars would find no trouble in robbing the Treasury. It is strange they have never attempted it. As to ordinary locks I could take an ordinary case-knife or a piece of stiff wire and open every door on the avenue from the Capitol to the Treasury. And it would not take me much longer than it would to walk that distance. No door would take me longer than a couple of seconds. I can open any trunk with simply a little tap with a hammer, and won't injure the lock in the least. If you forget your combination come in."

An Ancient Danish Bell.—Much interest has been aroused in Boston antiquarian circles by the deciphering of the Danish inscription on a heavy brazen bell which until recently had been on Castle Island, in Boston Harbor, where Fort Independence stands, ever since the memory of people now living. Its quaint appearance and mysterious inscription led Major C. W. Raymond, of the United States Corps of Engineers, who has charge of the fortifications of the harbor, to bring it to his office in Boston. The Danish consul, who has examined the inscription, finds that it reads when interpreted, "Belonging to the Patriot," thus leading to the conclusion that it was attached to a vessel of that name which entered the harbor years ago. The characters composing the inscription have long since ceased to be used by the Danes, and there is little doubt that they go back to a period of two centuries or more ago. The bell is of antique shape. It can with difficulty be lifted by an average man, The letters of the inscription stand out in bold relief from the tarnished metal, which bears the scars of many years of exposure. Some are of the opinion that this discovery verifies the theory that the Norsemen found their way into Boston Harbor. The bell certainly antedates the War of Independence.

Southern Charcoal Furnaces.—Concluding an editorial article on the outlook for pig iron, the Chattanooga *Tradesman* says: "Another item in the revolutionary process of the last four years has been the enforced changing of great numbers of charcoal furnaces to coke on account of the latter fuel being cheaper and more efficient. It seems now as if there would not be a dozen charcoal furnaces in the South next year."

The Iron Age

AND

Metallurgical Review.

New York, Thursday, November 27, 1884.

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The Pending Reciprocity Treaties.

Two important treaties will come before Congress this winter for final disposition. First in order of time is the treaty with Mexico, which has been approved by the President and ratified by the Senate, only needing the action of the House of Representatives to put it into practical operation. The other and more recent treaty is that reported by cable to have been concluded between our minister to Madrid and the Spanish Government for the purpose of establishing so-called reciprocity between Cuba and Porto Rico on the one hand and the United States on the other. Against both of these treaties there are formidable elements of opposition which may interfere with their approval by the United States, notwithstanding the apparently easy progress which one treaty has made through all the preliminary stages, and the favor with which the other treaty is regarded in commercial circles. If no other consideration were to have weight in these matters than the extension of our foreign trade, it is evident that there would be very little opposition to either measure, and the movement in favor of commercial reciprocity would grow until not only Mexico and the West Indies, but Canada, Central America and all South America would be connected with the United States in a grand American customs union. But there are other considerations which obtrude themselves, and some of them are so important that they are attracting a great deal of attention, even among ardent friends of the extension of American commerce.

Against the Mexican treaty it is urged that some private companies have been formed, not only in the United States, but in Europe, to acquire control of Mexican sugar and coffee plantations, import Coolie labor and enter into the production of these tropical essentials on a large scale for the American market. That this is not an unlikely story is shown in the case of the Sandwich Islands, which are now practically under the control of a monopoly having its headquarters at San Francisco, levying tribute on the whole Pacific coast, and alone realizing whatever benefit is to be derived from the operations of the Hawaiian reciprocity treaty. If there is any danger that a similar condition of affairs shall be created in Mexico, and the remission of the duties on sugar shall operate as a bounty to reward the unscrupulous enterprise of a few men of wealth, it would appear that some further investigation should be made by the House of Representatives before it gives its consent to anything that would support such a scheme. A monopoly of this character should certainly be very objectionable to our national law-makers.

As to the Spanish-American treaty, it seems to be a "reciprocity" treaty only in name. A clause admits to the United States free of duty "sugar not above No. 16 Dutch Standard," which is the leading production of Cuba and Porto Rico, also molasses, coffee, dye and other woods, cacao, fruits and some other vegetable products. One-half the present duty is to be charged on tobacco, but it is also to pay internal-revenue duties. As to the productions of the United States to be admitted into Cuba and Porto Rico, the treaty appears on a superficial examination to be eminently favorable, but a closer analysis shows that the benefit to be derived is more apparent than real. Long lists of manufactured articles are to be admitted free, but others are to be admitted at "reduced rates," the most desirable articles in Cuban trade being in the latter list, and not in the former. For instance, domestic flour will not be admitted to Cuba free of duty, but will still be charged a sufficient amount to protect the flour trade with the mother country. American flour would form a very important part of the reciprocal trade if it were put on the free list. Flour is one of our principal productions, as sugar is of Cuba. Sugar is one of our minor productions, while flour is produced in Spain. Yet we are asked to destroy our domestic sugar production, while Spain preserves her flour trade with Cuba. Still, if the United States were the sole country with which Cuba and Porto Rico were to trade in manufactured products, there would undoubtedly be an advantage in having these articles made free of duty or scheduled at low rates: But under her treaties Spain will be obliged to render the same favors to Great Britain, Germany and France, notwithstanding the solemn compact into which Minister Foster is said to have entered with the Spanish Government on this point. If these other countries secure equal advantages with us in the trade in manufactured products, we will then have given up, say, $25,000,000 in sugar duties annually, destroyed our domestic sugar production, and perhaps will have a paltry increase of $3,000,000 or $4,000,000 a year in our exports to show for it. Unless our articles of chief export are put upon a precisely equal footing with Cuban articles of chief export there is no reciprocity. The proposed treaty would merely supply Cubans with more money with which to buy Spanish flour, British and French machinery, and British, French and German textiles.

We are heartily in favor of proper commercial treaties. We know that we have a great deal to gain in building up commercial connections with other nations. An exchange of commodities on a proper footing is a very good thing for the countries concerned. We do not desire to isolate ourselves from the rest of the world. But we would like to get whatever we need from other countries by making a fair exchange. We have been fleeced too often in foreign trade matters. Domestic affairs have been managed with tolerable sagacity and shrewdness, but we are handled like children as soon as we open negotiations with foreigners. There is surely no such pressing need of a commercial treaty with Spain that we should make these tremendous concessions to get it. Cuba, by the way, is not the only sugar-producing country in the world. If Spain will not make a proper exchange of commodities with us, could we not effect a treaty with Bismarck and admit beet-root sugar from Germany if he will give us free admission for our pork products? Could not a like treaty be made with France? Our sugar duties should not be thrown away for a mere morsel of foreign trade. They are so important that they should secure for us a huge slice of the trade of the world. The Spanish-American treaty is evidently just what we do not want, and we are not impressed very strongly with the wisdom of the United States representative who negotiated it. He would have us act like the dog in the fable, who dropped his chunk of meat in the water in reaching for its shadow.

The California Manufacturers' Association, which is composed of the leading manufacturers of the Pacific slope, held its first annual meeting at San Francisco, on the 10th inst. We publish a tolerably full report of the proceedings in another column. It will be found that, while the association does not lose sight of the fact that the local trade should be carefully looked after, and that measures should be taken to secure preference for domestic manufactures, at the same time much attention is given to the question of developing commerce with Mexico. With this end in view the association sends its president, A. S. Hallidie, to attend the inauguration of General Diaz as President of our sister Republic, which event will occur on December 1. Mr. Hallidie will take with him a suitable address prepared by a committee of the association for presentation to General Diaz. We regard this evidence of commercial enterprise on the part of the toilers of the Pacific slope with much gratification, and trust that the efforts of the California Manufacturers' Association will meet with abundant success in building up an international trade, as well as in strengthening the lines of local industrial development.

The Eastern Pig-Iron Trade.

During the past year so many reports have been current of the increasing quantity of Western and Southern pig iron being used in this State, New Jersey and New England that we finally concluded to investigate the matter, and ascertain, if possible, the extent to which the pig irons made in other sections of the country were supplanting the local product. The result of our inquiries has been placed before our readers from week to week, and we now propose to summarize the information obtained. In New England both Ohio and Southern pig irons seem to have secured a strong foothold, some consumers reporting that they use from one-half to two-thirds of these outside irons in their foundry mixture. This proportion is by no means uniform throughout New England, in most localities the old brands of North River, New Jersey and Eastern Pennsylvania irons, which for distinction may be termed Eastern irons, being still used in preference to the unfamiliar brands coming from Ohio and the South. Experiments are being made with the latter in many directions, however, and the circle of their consumers is gradually widening. The progress made in New England by Southern pig iron is largely due to the very favorable terms on which it is sold, though it is also claimed to be more generously graded than the Eastern irons. The price asked for delivery at the principal New England ports is usually the same as that asked for delivery at New York. As the Southern iron comes north by sea, this equality of prices will be understood. If it is offered at New York for the same price as Eastern pig iron, it will be sold at New England ports from 90 cents to $1 cheaper, as coastwise freight must be added to the tide-water price of Eastern pig iron when sold at points further east than New York. Ohio pig iron is not so favorably situated for the New England trade, as a long railroad haul is necessary, and it can only reach distant Eastern points when freight rates are low enough. Trade in that direction is therefore spasmodic, but when it is in progress the competition from Ohio is reported to be very keen.

In the vicinity of Albany and Troy, in this State, there is less heard of Southern iron and more of Ohio iron. Their position as to freight is reversed in that locality, Southern iron being at a disadvantage, though even there it is reported that a little Southern iron has been used latterly. Ohio irons are regarded with special favor, both as to price and quality. Though some stove founders report themselves using no Western iron, and a few say that only 10 per cent. of their mixture is obtained from Ohio, others state that they are using from 25 to 60 per cent., and will use even more next year if prices continue relatively as they are now. A very prominent stove manufacturer of Albany says that, in his opinion, there will shortly be no Eastern iron consumed there for foundry purposes unless Eastern manufacturers meet Western prices, which are from 75 cents to $1 per ton less. In considering the condition of the Albany pig-iron trade it must be borne in mind that Eastern Pennsylvania irons have not been driven out of that market. For years they have only enjoyed a part of it, as a great deal of the pig iron consumed there was made in local furnaces situated in the Hudson River valley. Those furnaces are now almost all out of blast, only three or four stacks, we believe, being in operation along the Hudson, and their trade is mainly that which has been absorbed by Western furnacemen. The Lehigh Valley furnace companies seem to be able to retain their part of this trade despite the efforts of the West to secure it all. They are evidently meeting Western prices when they are obliged to do so, as one stove manufacturer reports to us that "Eastern furnaces have "been compelled to abate some of their "profits (!) to meet the Western competition, "but they are sensible enough to do it."

In the vicinity of this city Southern irons have secured quite a slice of the trade, though by no means so large as has been reported. Freight rates on Eastern, Southern and Western irons seem to be so adjusted that they sell at very nearly the same price. A contest under such circumstances results in the trade being secured by the manufacturer who offers the best quality. Consumers are also benefited by having a much larger field from which to select their iron. In Philadelphia and vicinity from 1200 to 1500 tons of Virginia pig iron are used weekly, displacing local irons to that extent. The iron which has been sold in that market from other parts of the South has only been sold in irregular lots, chiefly to work off surplus stocks.

The question naturally arises in this connection, How many blast furnaces are in the respective sections, and how much pig iron are they making? Are the West and South making a great deal more iron than the East? According to our last quarterly statement of the condition of the blast furnaces of the country, dated October 1, there were then 221 anthracite furnaces in New York, New Jersey and the eastern half of Pennsylvania, 188 bituminous furnaces in Western Pennsylvania and the Western States, and only 37 bituminous furnaces in the Southern States. Charcoal furnaces are omitted from the comparison. Of the number of furnaces in each of these three sections respectively, 38 per cent. were in blast in the East, 32 per cent. in the West, and 48 per cent. in the South. So far as relative condition is concerned, the East was better off than the West, though the South surpassed them both, but it will be noted that there are but 37 furnaces in that section; consequently, its high percentage of active furnaces is, after all, not very significant. The weekly capacity of the active furnaces in the East was 23,319 tons of pig iron, of those in the West 32,459 tons, and of those in the South 7951 tons. According to this showing the West was turning out 50 per cent. of the pig iron made with mineral fuel, the East was making 37 per cent., and the South contributed 13 per cent. of the whole. These figures demonstrate that the Eastern pig-iron industry is by no means dying. Notwithstanding the abnormally high cost of the fuel used in the East, which is mainly anthracite coal, Eastern furnaces maintain a good, strong grip on the iron trade of this locality.

One fact will not escape attention in dealing with this question. The proprietors of Southern and Western furnaces complain of the unprofitableness of the business just as well as Eastern furnacemen. The Southern iron that comes to Philadelphia or New York or Providence is not realizing much over cost to the manufacturer, who finds the item freight-making a very respectable figure in the transaction. If sales in the North netted a handsome profit there would then be danger that in time Southern competition would be extremely formidable, as the idle furnaces there would all be put in blast and others built. But this movement, despite its present proportions, can only be looked upon as temporary, inasmuch as Southern manufacturers are apparently exhausting themselves in reaching this distant market. Almost the same remarks can be made concerning the Ohio irons sold in this section. If the price of fuel is reduced, which is not altogether an improbable occurrence with the present outlook in the coal trade, the Eastern manufacturers of pig iron will be able to assert themselves more vigorously in defense of what seems to be their territory. If the price of Eastern pig iron is then lowered even $1 a ton, it will go far toward barring out these competitors.

Bills Before Congress.

The time for the assembling of Congress is now very close at hand, being next Monday. A considerable number of important bills affecting commercial interests are on the calendar of either House awaiting action. Some of those which have been favorably reported upon by committees, we may briefly epitomize. Perhaps that which will engage the most general attention is a bill "to modify "existing laws relating to duties on imports "and the collection of the revenue," known as the Hewitt Tariff bill, to which we referred at length a short time ago. As this can be taken up at any time, it is quite sure to engage early attention and provoke earnest discussion. We have already given the details of the bill in these columns. Then there is the Lowell Bankruptcy bill, which has already passed the Senate and has many warm advocates. The necessity for the passage of a bill of this character, at least in its general features, is rendered more obvious by the financial disasters of the last few months. Another measure is the Senate bill "to amend Section 2776 of the Revised "Statutes of the United States, so as to "authorize the unlading of coal, salt, rail-"road iron and other like articles in "bulk, under the superintendence of "customs officers, at the expense of "the parties interested, at places to "be designated by the Secretary of the "Treasury within the collection district.' Still another bill which will excite more than ordinary interest is for "the encouragement "of the American mercantile service, and "to promote postal and commercial relations "with foreign countries." This bill is among the special orders, and unusual interest having been excited by the proceedings of the United States Commission appointed to receive testimony concerning our relations with Central and South America, and the weight of evidence volunteered by merchants being unquestionably in favor of subsidies, the probable action of Congress is the subject of lively conjecture among shipping merchants and importers. The bill designed to carry into practical effect the proposed treaty with Mexico is not the least important measure that will come up for action. The remaining bills of some prominence provide for the issue of circulating notes to national banking institutions, to establish a board of commissioners of interstate commerce, to secure cheaper telegraphic correspondence—the latter otherwise known as the Postal Telegraph bill—and to provide for an inspection of meats for exportation.

American Sugar Machinery and the Sugar Crisis.

During the fiscal year 1883 Cuba alone bought from the United States $1,246,296 worth of machinery for sugar houses, St. Domingo $220,541, Porto Rico $32,810, Brazil $184,563, Jamaica $28,208; thus five cane-sugar producing countries took, mostly from New York, Brooklyn and Philadelphia, in a single year no less than $1,712,418 worth of sugar machinery, without counting the portable railroad material for plantation use also ordered from this country to a considerable extent. For more than 60 years the Spanish West Indies have been in the habit of procuring their sugar-plantation machinery and machetes from the United States, and these have become justly celebrated. About 18 months since the Brazilian Minister of the Interior, after a trip through the Pernambuco and Bahia sugar regions, declared that what he had seen there of American machinery convinced him that it was the best for extracting the greatest percentage of saccharine matter from the cane. Since the abolition of slavery in the British colonies in 1834, in the French, Danish and Dutch colonies in 1848, in the United States in 1863, in Porto Rico in 1872, and partially in Brazil and Cuba since then, beet-root sugar has become a formidable competitor, and the most perfect machinery and approved modern processes are now required to produce sugar cheap enough from the cane. American machinists and inventors have been foremost in devising economical implements and methods, and have thus been able to more than hold their own alongside of English and French progress in this great industry.

Some 18 years ago the vacuum pan and centrifugal process were first introduced in Cuba from the United States, and they fairly revolutionized the entire plantation industry. The manufacture of clayed sugar was almost wholly superseded, and partly that of muscovadoes, by the new centrifugal sugars, the more so as their importation was the most profitable under our system of levying duty on the basis of the Dutch Standard. In the French colonies, since the abolition of slavery, another altogether new system has been introduced, and has been attended with such eminent success that most of the prominent cane-producing countries have adopted it, one after the other—we mean the central sugar-house system. A number of planters in a district limit their industry to the agricultural portion of it solely, and sell the cane by weight, after it is cut, to the central sugar-house, which is usually the property of a company, on shares. This sugar-house is furnished with the best machinery for grinding the cane, boiling the juice and producing even high-grade sugars, capable, if need be, of competing with refined in the consuming countries. All the waste is carefully utilized; the expressed dried cane serves as fuel or is made into paper pulp, and in this manner the higher wages of negroes and coolies since abolition are compensated for by a centralized, more economical and scientific system. Yet in spite of all the improvements of recent years in the production of cane sugar, beet root has made such strides that it becomes a serious question now as to which industry will survive the era of low prices that has been inaugurated. Sugar has fallen within the last month to the lowest point reached since 1847, with no immediate prospect of a rise.

The following table of the world's sugar production shows the rapid progress of the beet-root as compared with the cane industry:

	Cane. Tons.	Beet-root. Tons.	Total. Tons.
1849	919,182	95,500	1,014,682
1850	952,200	129,000	1,081,200
1851	977,547	162,000	1,139,547
1852	1,044,542	153,000	1,197,543
1879	3,487,045	1,393,939	4,880,984
1880	3,554,000	1,742,992	5,296,992
1881	3,669,656	1,784,314	5,453,970
1882	3,605,301	2,059,469	5,664,770
1883	3,759,000	2,225,000	5,984,000

In other words, 30 years had sufficed to nearly sextuple sugar production. Of beet-root sugar twenty-four times as much was turned out as there had been 30 years previous; of cane sugar not quite four times as much.

Meanwhile, quite a number of circumstances have been at work to stimulate sugar consumption all over the world, notably in Anglo-Saxon countries. Thirty years since, sugar was still considered a luxury, especially in poorer Continental countries; now it is an indispensable necessary of life, even among the lowly. The waste in England and her colonies and in the United States is very great, and the present extreme cheapness leads to a consumption greater than ever. From a report drawn up by Mr. Giffen for the London Board of Trade it appears that the consumption of sugar in England has reached the enormous total of 1,083,000 tons per annum, or 68 pounds per head of population. The consumption, from 25 pounds per head in 1840 to 25 pounds in 1850, reached 35 pounds in 1860, 47 pounds in 1870 and 63 pounds in 1880. The increase in the United States is also noteworthy. From 1854 to 1863 the total amount was 3,738,070 tons, while from 1874 to 1883 it had risen to 7,884,945 tons, and during the present year will amount to about 1,000,000 tons.

Members of the Senate and House Committees on Ordnance visited the steel works and shipyards in the vicinity of Philadelphia, last week, and will this week spend some time at Pittsburgh and possibly other

points in the West. They have very little time left before the meeting of Congress for the acquisition of knowledge about the facilities possessed by this country for the manufacture of steel suitable for heavy guns. We trust, however, that what they have seen has impressed them with the belief that whatever the United States Government needs in this line can be supplied by domestic manufacturers.

A Conundrum.

Writing upon the subject of competition in the Eastern market by Western and Southern pig-iron manufacturers, a correspondent says:

We believe that locality is a secondary consideration, and that intelligent conduct of the business, and energy in its prosecution, have more to do with the production of pig iron than any advantage of mere situation. Those who depend upon running furnaces as their fathers did, and sit in their offices, while unskilled and uneducated labor directs the actual process of manufacture, will be left far behind by those who intelligently watch and direct the several stages from the ore in the mine until the iron is ready for the market. This fact is beginning to be appreciated, and those who fully realize it and govern themselves accordingly will win.

This really does not seem to have any immediate bearing on the subject of our inquiry as to how far Southern and Western irons had succeeded in supplanting Eastern irons. We are at a loss to comprehend under the circumstances precisely what our correspondent means. His remarks are undoubtedly sound, even if intended for general application. A very old maxim conveys pithily the same truth in effect: "He who "by the plow would thrive, himself must "either hold or drive." If, instead of holding or driving, he were to employ a skilled and trusty substitute at a sufficiently reasonable compensation, however, we have our misgivings as to the infallibility of the aphorism. This, on further reflection, is probably the point of our correspondent's remarks. He refers to the fact that, evidently in some cases which have come under his observation, "unskilled and uneducated "labor directs the actual process of manu- "facture." That is, the person who "holds or drives" is not a good substitute for the owner. But to what section, more than to any other, is this criticism of manufacturing methods applicable? Our correspondent evidently has some one or perhaps several pig iron manufacturers in view to whom his remarks are applicable. Are they Eastern manufacturers? We do not believe it is true of the manufacturers of this section, at least not to such an extent as to make it a noticeable shortcoming. But on this point our correspondent fails to enlighten us. He gives us a conundrum, and does not send the answer along with it. He states an enigmatical proposition, and furnishes no clew to its solution. If anybody feels aggrieved, won't he please write to us? Perhaps that is the only way in which we shall ever get to the bottom of this criticism of furnace management.

Quality Standards for Tin Plates.

The Metal Worker of New York has done all branches of the tin-plate trade an important service in the publication of a table of standard quality specifications for tin and terne plates, for the accurate and convenient description of all grades of plates known in the market. We print the table of specifications in another column. In its editorial comments *The Metal Worker* says:

There are several leading features of tin plates, or, to express it otherwise, several grades of quality possessed by the plates, irrespective of their coating, which every consumer readily recognizes. For example, some plates will not even bend a square edge without more or less fracture. Yet these plates are useful for such purposes as the hoops of cans, the seams of which are soldered, and therefore there is good reason why they should be bought by manufacturers who have occasion to employ them. The next grade of plates, referring simply to the physical properties of the plate, without any reference whatever to the coating, may be described as capable of bending a square edge without fracture, yet having too little toughness to warrant grooving. A third grade may be described as capable of grooving, but will not double-seam. A step still higher shows plates that may be double-seamed if care is taken, while a still better grade of plates will double-seam under all reasonable circumstances. Perhaps the highest quality that can be found in the market at present is indicated by successfully withstanding the strain caused by doubling the plate flat down upon itself and opening it out straight without a fracture.

With these different grades before him, from which to select in ordering, the consumer need have no difficulty in making known his wants. Instead of ordering "Spread Eagle" in the hope that it will double-seam, he disregards the brand and says, "Send me a plate that will double-seam under all reasonable circumstances." On the other hand, when he requires a plate that will answer a satisfactory purpose in making up the bodies of cans, he desires something that is very cheap. In his order he says, "Anything that will form into a hoop, even if it does not have sufficient strength to make a square bend without fracture, will answer." From this it is evident that, after all, it is possible for the consumer to indicate his requirements in ordering tin plates in such terms as are unmistakable. By care and precision in framing his order he can be sure of getting just what it is necessary to have, and there is no need to buy a higher quality nominally than is required in order to insure practical working.

When it comes to a consideration of the finish or coating of plates, there are several other points to be considered. For example, some bright plates are very cheaply coated and are known in the market as "coke finish." The coating of tin is of the thinnest possible character, and serves only to preserve the plate from rust and facilitate soldering in the process of making up into ware which is afterward painted or japanned. Other plates may be described as having an "ordinary surface," still others as having a "fine surface" and others again as having an "extra fine surface." Roofing plates have the same physical characteristics as we have already mentioned, and there are in the market plates having a "light coating," others having coating of "ordinary" thickness, and still others the coating of which may be described as "heavy." The coating of roofing plates may be more accurately indicated by the pounds of coating metal to the box. Several importers are putting out plates at the present time guaranteed to carry a specified number of pounds of coating to the box. In roofing plates the question is one of weight of coating rather than the finish of the surface. The consumer, therefore, in buying, taking into account both the quality of the plate and the nature and finish of the coating, words his order for bright plates as follows: "Send me plates that will groove, and that are of fine surface," and for terne plates, thus: "Send me roofing plates carrying 15 pounds of coating to the box, 14 x 20, and which will double-seam with care," or he describes other qualities he desires the plates to possess, as the case may be. From what has preceded it is very evident that the careful, thoughtful consumer has it in his his power to indicate just what he requires, and if he is so fortunate as to deal with a house that is sufficiently posted in the qualities of the goods it handles as to understand his requirements and know what plates will fill them, he can undoubtedly get what he wants, no matter how good or poor the plate may be that will meet his requirements.

If the reader has followed us this far, he will readily comprehend the scheme that we have had in mind all along when advocating the abolition of brands and the substitution of quality specifications. While it is possible for the consumer to define his requirements without resorting to the use of brands, and that, too, much more specifically than is possible by depending upon brands alone, a better plan—or, at least, one more easily used than that explained above—may be employed. Supposing that each of the qualities of plate above described is indicated by a letter of the alphabet. Supposing, also, that the various coatings which are applied to the plates are also indicated by letters of the alphabet, all as described in detail in another column. Then, in ordering, instead of saying, "Send me a plate that will double-seam under all reasonable circumstances, and which has a fine finish," the order would go, "Send me a GV," G, by the explanation given elsewhere, representing the first specification and V the second. In the case of terne or roofing plates, the weight of the coating to the box is added. For example: If a very fine quality of roofing plate is wanted, the order would read "GR 20," supposing that the plate was a 14 x 20, or "GR 40," in case it was a 20 x 28, R indicating terne coating, and 20 and 40 respectively the pounds of coating to the box.

We commend this scheme, which is explained in full elsewhere in this issue, to the attention of consumers of tin plate generally. Every step in the reform which has been brought about in the tin-plate business has followed a demand made in the interest of and enforced by the consumer, and this is of really more importance than some which have preceded it. At the outset, in the agitation of this subject in *The Metal Worker*, importers derided the idea of any reform in their methods of business, and more particularly the introduction of plates of really good quality. In the short space of two years all this has been changed, and now prominent houses are competing with each other in the quality of their goods. Plates of indifferent quality with high-sounding names are out of date, and "old-style" plates, guaranteed, are the rule. But, however satisfactory the state of the trade may be at the present time, there is need of still further advance. We lay this scheme before consumers with the suggestion that an extensive employment of it will be sure to bring its own reward. Importers of tin plate, all of whom have had their attention called to it, will recognize these symbols, and, their meaning being unmistakable, they will fill orders to them. The general employment of this plan in sending orders will have the good effect of compelling importers to more carefully scan the quality of the plates they handle, and of making them familiar not only with the requirements of their customers, but also with those plates which most satisfactorily meet those requirements.

This plan of quality designations is of equal importance and value to importers and dealers. It renders guarantees much easier to formulate than ever before. It facilitates correspondence with consumers. To assert that a plate is, for example, "GR 40 Metal Worker Standards," saves the writing of several lines in a letter which would otherwise be necessary to describe what it really is. It also facilitates telegraphic communications, and the symbols we have indicated in another column are a desirable addition to any telegraphic code. The plan can be advantageously employed also in placing importers' orders with makers and in conducting correspondence with houses on the other side. In adjusting prices, plates which are strictly "GV," for example, are worth more than those which only grade up to "FT." In fact, considering the absence of all system whatever in grading plates, and the unmistakable standards which this plan affords, we incline to the opinion that it is really of more importance to the importer and manufacturer than to the consumer.

The Metal Worker Standards

FOR TIN AND TERNE PLATES.

QUALITY OF PLATE.	KIND OF COATING AND FINISH OF SURFACE.						
	LEADED OR TERNE.			BRIGHT.			
	Light Coating. M*	Ordinary Coating. Q*	Heavy Coating. R*	Coke Finish. S	Ordinary Surface. T	Fine Surface. V	Extra Fine Surface. Y
A — Will not bend a Square Edge.	AM	AQ	AR	AS	AT	AV	AY
C — Will bend a square edge, but will not groove	CM	CQ	CR	CS	CT	CV	CY
D — Will groove, but will not double seam.	DM	DQ	DR	DS	DT	DV	DY
F — Will double seam with care.	FM	FQ	FR	FS	FT	FV	FY
G — Will double seam under all reasonable conditions.	GM	GQ	GR	GS	GT	GV	GY
H — Will double flat and open without fracture.	HM	HQ	HR	HS	HT	HV	HY
J — Will do shallow stamping.	JM	JQ	JR	JS	JT	JV	JY
K — Will do ordinary stamping.	KM	KQ	KR	KS	KT	KV	KY
L — Will do deep stamping.	LM	LQ	LR	LS	LT	LV	LY

*The coating of Leaded or Terne plates may be more accurately specified by giving the weight to the box. In such cases, follow the **M, Q or R,** as the case may be, with the number of pounds, thus: "I C 14 x 20 **F Q** 12," or "I C 14 x 20 **G R** 18."

EXPLANATION.

THE METAL WORKER STANDARDS are upon the plan of using a letter of the alphabet for each of the more important qualities, both of the plate itself and the coating of the plate. The physical properties of the plate are given in the column at the left, while the different coatings and variety of finish which may be applied to it are in the headings of the columns to the right. In the squares at the intersections of the horizontal and vertical columns will be found the combination of letters designating both quality of plate and coating. Thus, a plate that can be depended upon to double seam and which has a fine bright surface is indicated by **G V.** A quality designation of this kind is definite, and therefore very desirable for use in transmitting orders. Gauge and sizes of plates are to be given in addition, and in the usual way; as, I C, I X, and 14 x 20, 20 x 28, &c. Wasters are designated by **W.** Particulars of a general nature, like "true gauge," "square trimmed," "absence of wire edge," "free of wasters," &c., are to be expressed in the usual way.

OBITUARY.

DANIEL D. BADGER.

On Monday, the 17th inst., there died, at his residence in Brooklyn, Daniel D. Badger. Mr. Badger, who was the first to introduce iron for building and architectural purposes in this country, was born on Badger's Island, which lies below Portsmouth, N. H., and the Portsmouth Navy Yard, in the year 1806. During youth he was employed in working iron in his native town, after which he went to Quincy, Mass., where he worked on the first railroad car that was ever built in the United States. From Quincy he removed in 1829 to Boston, where he established works for the manufacture of wrought iron as adapted more particularly for use in shipbuilding. In this business he was very successful, and soon amassed a considerable fortune. His attention having been called to the possibility of using iron as a building material, he commenced studying the subject and soon became convinced that iron could be employed to great advantage in the construction of buildings. In the year 1840 he erected on Washington street, Boston, the first iron front ever seen in America, but so great was the prejudice against his enterprise that he was compelled to give a guarantee that if it proved a failure he should remove it at his own expense. The columns and lintels of this building were of iron. About this time Mr. A. L. Johnson, of Baltimore, having patented rolling iron shutters, Mr. Badger purchased the patent and introduced the shutters into his new structures, known then as "Badger's Fronts," which were slowly coming into favor. While carrying on his business in Boston, he also had a saw manufactory at Woburn, Mass., which was destroyed by fire. Finding that his factory in Boston was too small for his rapidly increasing business, Mr. Badger, in 1846, removed to New York, where, in company with Mr. Charles Reed, he established a factory at Nos. 42, 44 and 46 Duane street. Here he found the builders, the fire insurance companies and the fire department all violently opposed to his innovation. He had to struggle against objections of the most diverse character, but, steadily persisting in his purpose, he untimately overcame all obstacles and brought iron into use as a leading building material. Shortly after establishing his factory in Duane street, it became evident from the increasing demand for his structures that greater facilities for their preparation were needed, and the foundation was laid for the extensive works afterward known as the Architectural Iron Works, situated on 13th and 14th streets, between Avenues A and B. In these works he had every department of his business provided for, from the foundry, the pattern shops and the architectural rooms. The business of erecting iron buildings had grown to such extensive proportions that Mr. Badger felt unequal to the task of managing it alone, and a company was formed under the title of the Architectural Iron Works, which was incorporated in 1856, and of which Mr. Badger became president. This company constructed iron buildings in New York, Chicago, Milwaukee, St. Louis, New Orleans, and in nearly every city of any size throughout the United States, and also in Egypt, Cuba and Central and South America. In 1876 Mr. Badger finally retired from active business life, and since then had resided in Brooklyn.

Among the many iron structures which were erected under Mr. Badger's direction in New York were the Grand Central depot, the Hudson River Railroad freight depot, the Gilsey Building and the Manhattan Market, which was afterward destroyed by fire. The ironwork of the new post office in Boston was also built by him. The first buildings erected by Mr. Badger were by many regarded as experiments, but from the outset he was sanguine they would receive the public approval, and the universal use of iron as a building material at present attests in no measured manner the wisdom of his foresight.

WILLIAM ANSON WOOD.

William Anson Wood, founder of the William Anson Wood Reaping and Mower Company, of Youngstown, Ohio, and a brother of the Hon. Walter A. Wood, of Hoosick Falls, and of Eliphalet Wood, of Irvington, N. Y., died at Templeton, Mass., on Tuesday of last week, in the 72d year of his age. Mr. Wood had been declining in health for two years. His life was one of unremitting industry and devotion to mechanical invention, and he accomplished much in the line of improving mowing and reaping machines. His name may be justly classed with the long list of American inventors who have so largely added to the renown of this country. For 15 years Mr. Wood was associated with his brother Walter, whose agricultural implements have a world-wide celebrity. William retired from his brother's business in 1871 and started a new company at Albany in 1874, under the auspices of the late Hon. James S. Thayer, which company came to grief, leaving Mr. Wood financially embarrassed. Other parties soon after purchased the good-will of the old company and reorganized it on a solid basis at Youngstown, Ohio. Mr. Wood was well and favorably known in Albany and Rensselaer counties, having always taken an active part in political affairs, formerly with the old Whig party, and since with the Democratic party. He was unanimously nominated for Congress by the Democrats, in opposition to his brother Walter, in 1878, but magnanimously declined to run in opposition to his brother. He leaves a widow, one son and one daughter.

California Manufacturers' Association.

The manufacturers of the Pacific slope have organized an association which proposes to make itself felt in trade matters in that locality. We take the following report from the San Francisco *Bulletin* of the proceedings at a recent meeting of the association:

The first annual meeting of the California Manufacturers' Association occurred on the 10th inst., at San Francisco, in Room 43, Merchants' Exchange Building, President Hallidie in the chair. The annual reports of the president and secretary were received.

In making his annual report President Hallidie called attention to the fact that in California the conditions which surround and affect the manufacturing interests are in a measure different from those existing in the older States of the Republic, by reason of our peculiar location on the Pacific seaboard, by which, up to a little time ago, we controlled a vast trade, which the competition of the Northern Pacific Railroad, with Portland as its terminus, and the Southern Pacific, with Los Angeles as its terminus, has materially interfered with. Our unique position has passed away, so far as the buying and selling of goods is concerned, which have been manufactured outside of San Francisco, for Portland and Los Angeles have now equally as good railroad facilities. Our hope is our manufactures, therefore, and their proper development. Yet individual interests have had but little in common with the general and greater interests underlying the elements of industry considered on broad principles that affect the general prosperity of the State, and until the organization of this society those who control or who largely influence the essential elements of this State's future prosperity have attempted nothing in common as a body, and in consequence there has been disintegration where there should have been consolidation, and individual rather than collective effort and action. The members of the association are pledged to use every fair and honorable means to strengthen and promote the industrial interests of the State. So far its work has been of a silent, but persistent and constant, character. Much has, however, not been done, owing to a lack of means. The membership should be much increased. There should be more meetings for the exchange of views and to strengthen the hands of the directors. Since the completion of the lines of railroads running into the Republic of Mexico the attention of the public has been drawn to that country, with the expectation that it offers a new field for the products of the United States. The commercial treaty that has been partly negotiated with that country it is hoped will pass at the coming session of Congress. It would be a great benefit to California. The President-elect, Gen. Porfirio Diaz, is to be inaugurated in December. It would be eminently fitting that this association should present him with an address as coming from the citizens of San Francisco and from us. President Hallidie concluded by urging upon the members of the association the absolute necessity for them to develop the manufactures of the Pacific coast.

Secretary George C. Hickox's report was a history of the association's work from its inception in September, 1883, and its organization on the 29th of October, 1883. The secretary reported that having at various times made known his observations of the general depression in business in this city and the many opinions expressed to him as to its causes while canvassing for membership, all of which gave index of a want of that fellowship and unity of interest which should properly prevail between manufacturer and merchant, it was conceived that harmonious action might be brought about through friendly consultations. Conferences between the Chamber of Commerce, Board of Trade and the directors of the association followed, with a view of inaugurating a concerted movement toward the revival of local trade and domestic industries.

The report proceeds: "The inauguration of this movement on the part of the association's directors may be regarded as the first important step which shall lead to permanently useful results. Among the measures forming part of the association's work were the memorials addressed to Congress for increased naval improvements, improved coast defenses and the building of a new post office; the issuance of circulars advocating the general patronage and preference of domestic manufactures and products; sending petitions to all school boards and trustees to select and purchase California printed books of equal merit to those published elsewhere; the protest to the House of Representatives against further legislation destroying the protection granted under the United States patent laws; soliciting legislation to relieve the tax on tools, machinery and raw material not in process of manufacture and not for sale; sending E. H. Dyer, of Alvarado, as representative to the National Industrial Congress at Chicago in May last. During the year there were four meetings of the association and 18 of the directors, besides the trade conferences."

Treasurer N. W. Spaulding's report showed that the annual receipts had been $3995, the expenditures, $3021.53, leaving on hand $973.47.

A. H. Phillips introduced the following resolution, which was adopted:

Resolved, That a by-law be added to our code of by-laws in the following words, to-wit: Any non-resident of San Francisco or Oakland who has no place of business or representative in either city, and who may be otherwise eligible, may become an associate member of this association upon the payment of an entrance fee of $10 and an annual payment of $6, both payable in advance.

Arpad Haraszthy introduced the following preamble and resolutions:

WHEREAS, Gen. Porfirio Diaz, President-elect of the Republic of Mexico, will be inaugurated on the first day of December next, and it is desirable that the industrial and commercial interests of this State should be represented at said inauguration, and it is also desirable that the bonds of amity and the traditional relations between the State of California and the Republic of Mexico should be strengthened and fortified, and that proper action should be taken by this association and such other bodies as may cooperate to recognize the importance of the event and its bearing upon the future commercial relations of the Republic of Mexico and the United States; therefore be it

Resolved, That a proper and suitable address be prepared and sent to General Diaz on the day of his inauguration as President of the Republic of Mexico, or that such steps be taken in conjunction with the Chamber of Commerce and Board of Trade and such other associations as may be selected to recognize in a suitable and dignified manner the importance of the event

Resolved, That the President of this association, Mr. A. S. Hallidie, is hereby appointed a delegate to represent the Manufacturers' Association of California at the inauguration of General Diaz as President of Mexico, and the proper officers are hereby instructed to prepare and execute the necessary credentials.

Resolved, That the Chamber of Commerce and Board of Trade are respectfully invited to take such action in the premises, with a view to co-operation, as in their judgment shall be best.

Resolved, That a committee of three be appointed with authority to take such further steps as may be necessary to carry out the spirit and intention of these resolutions.

The resolutions were unanimously adopted, and Messrs. Hallidie, Haraszthy and Preston were appointed a committee in accordance with the last resolution.

The Oliver Chilled Plow Works, South Bend, Ind., have, it is reported, closed their works, not intending to open until the men agree to work half time. Another report is to the effect that they desire to run their their works four days with a reduction in wages per day. There is no doubt that they intend reducing their output of plows.

THE Iron Age Directory AND Index to Advertisements.

Special Notices.

For Sale,

List of LATHES, DRILLS, PLANERS, SHAPERS, and other Tools and Machinery in stock for immediate shipment. Special prices on any of these will be quoted on application. Write for them.

Send for our Illustrated Catalogue of Machinery.

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16 in. x 6 ft. Fifield Screw-Cutting Engine Lathes.
16 " x 8 ft. " " "
18 " x 10 ft " " "
20 " x 8 ft, " " "
20 " x 10 ft, " " "
22 " x 12 ft. " " "
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24 " x 12 ft. " " "
24 " x 16 ft " " "
24 " x 24 ft, " " "
28 " x 14 ft, " " "
30 " x 16 ft. " " "
20 " x 8 ft. Geneva " "
20 " x 10 ft, " " "
20 " x 12 ft, " " "
26 " x 14 ft. " " "
16 " x 8 ft. J. B. Reed " "
18 " x 8 ft. " " "
18 " x 10 ft. " " "
18 " x 12 ft. " " "
26 " x 12½ ft. " " "
16 " x 6 ft. " " "
20 " x 8 ft. N. Dustin Screw-Cutting Engine Lathes.
26 " x 10 ft, " " "
18 " x 8 ft, Oesterlein & Bernhardt, Engine Lathes.
18 " x 8 ft. Lodge Barker Engine Lathes.
15 " x 6 ft. Prentice " "
11 " x 5 ft. " " "
13 " x 6 ft. Ames " "
27 " x 6 ft. J. F. Blair, " "
16 " x 6 ft. F. E. Reed " "
11 " x 6 ft F. E. Reed, Foot Power, Screw-Cutting Lathes.
8 " x 30 in W. C. Young, Amateur Foot Lathes.
10 " x 3½ ft. W. C. Young, Foot Lathes
12 " x 5 ft. W. C. Young, Foot Lathes, Screw-Cutting.
12 " x 5 ft. W. C. Young, Hand Lathes.
14 " Single, Gents' Wood-Turning Lathes.
16 " Double, " " "
20 " Single, " " "
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DRILLS.

15½ in. Swing Peerless Drills.
18 " " F. E. Reed, Post Drills.
18 " " H. & B. Post Drills.
20 " " Bickford Lever Feed Drills.
20 " " " Wheel Feed Drills.
24 " " " Drills, Wheel Feed.
28 " " " Drill, Back-Geared.
32 " " " Drills, " "
32 " " " " " Self-Feed.
22 " " Currier & Snyder Back-Geared Drills.
26 " " " " " Self-Feed Drills.
30 in. Swing Prentice Back-Geared Self-F'd Drills.
36 " " Harrington " " "
26 " " Standard Drills.
28 " " " "
48 " Bickford Boring and Turning Mills.

IRON PLANERS AND SHAPERS.

36 in x 36 in x 10 ft. Geneva Iron Planers.
30 " x 30 " x 7 " " "
30 " x 30 " x 6½ ft, " "
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15 in Steptoe Shapers.
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60 lbs. Long & Allstatter Power Hammers.
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No. 4 " " " " and Shears.
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No. 2 Boynton and Plummer Power Bolt-Cutters.
" 2½ " " " " "
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Narragansett Foot-Power Circular Sawing Machines.

ENGINES AND BOILERS.

N. Y. S. S. P. Co., Vertical Engines. 2, 3, 4, 5, 6, 8, 10 12 Horse-Power.
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Phœnix Stationary Tubular Boilers. 10, 15, 20, 30, 40, 45 Horse-Power.
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Rumsey Vertical Boilers. 2, 2½, 3, 3½, 4½, 5½, 6½, 7½, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24 Horse-Power.
12 in. x 12 in. Brownell & Co. Stationary Engines. 30 Horse-Power
10 in. x 14 in. Brownell & Co. Portable Engine and Boiler, 25 Horse-Power.
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1 Horse-Power New Baxter Engine and Boiler.
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4¼ " " " "
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1000 TONS No. 1 FORGE IRON.
500 " MIXED WR'GHT TURNINGS IRON.
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Also a large line of Second-hand Machinery, Boilers, Tools, Fixtures, Usable Iron and Belting.

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A thorough Hardware man to take charge of an important Eastern sales department. Apply by letter only, giving age, experience, references, and salary expected, to

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Special Notices.

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LONDON, 1885.

IMPORTANT TO INVENTORS.

An International Inventions Exhibition, under the patronage of Her Majesty the Queen and the presidency of His Royal Highness the Prince of Wales, will be held in London in 1885.

The Exhibition will be opened in May, 1885, and will continue open for a period of about six months.

Division I (Inventions) will be devoted to Apparatus, Appliances, Processes and Products invented or brought into use since 1862, and illustrations thereof.

Division II (Music) will consist of examples of Musical Instruments of a date not earlier than the commencement of the present century; and of Historic Collections of Musical Instruments and Appliances, and Paintings, Engravings and Drawings representing Musical subjects, without any restriction as to date.

Medals in Gold, Silver and Bronze, and Diplomas of Honor, will be awarded on the recommendation of Juries.

No charge will be made for space. It is expected that American Inventions will take a prominent place in this Universal Exhibition, and, for the convenience of contributors from the United States, the latest date for the reception of applications for space has been extended from the 1st October to the 31st December, 1884.

All necessary information and printed forms of application will be supplied on applying (marked "I I E") to

J. PIERREPONT EDWARDS,
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For Sale.

Will sell cheap for cash and time payments, or will exchange for real estate or lumber, any part of the following machinery, subject to inspection before purchase:

1 Train of Lauth's 24 in. 3-high Rolls.
1 Train of 2-high 22 in. Plate and Sheet Rolls and Duplicate Rolls.
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1 Compound 18 inch Muck Train and Duplicate Rolls.
1 Large Engine, 32 x 42, horizontal, 20-ton fly, doubly-braced wheel, 12 in. face
1 Large Rotary Squeezer for 150-lb Ball.
1 Large Roll Turning Lathe for Turning up Rolls.
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1 Plate Shear to shear as high as ¾-in Plates.
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1 Muck Shear.
1 Scrap Shear.
1 Scrap Shear and Engine.
1 Large sturtevant Blower and Pipe
Furnace Plates for 4 Charcoal Fires, including Valves, &c.
1 Battery of 3 extra flange Fire-box Boilers; size 28 ft. by 48 in; 2-flue, 16 in., to operate together or separate; with all connections.
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1 Track Scale, Wagon Scale, Mill Scales. Tools, Tramways, Buggies, Patterns, &c.

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All Second-Hand.

One 36 in. x 36 in. x 8 ft. 8 in. bed. Made by Barr, of Wilmington, Del.

Three by Bement & Son, Philadelphia, 30 in. x 30 in. x 8 ft. 6 in. bed.

One 30 in. x 30 in. x 6 ft. 6 in. bed.

One No. 1 Newton Milling Machine.

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Engine for Sale.

One Woodruff & Beach Horizontal Engine; cylinder, 18 in. diameter; spoke, 36 in.
It has a box bed, Wright's Automatic Cut-off, and is complete except the shaft.
Persons in need of an Engine are invited to examine it. The price is exceedingly low.
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One of the most complete stocks of Building, Housekeeping and Furnishing Hardware. Stock value at cash is now about $36,000. Will be sold at a sacrifice to wind up estate. Apply to

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Office Supervising Engineer and Architect, New Pension Building,
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Proposals are invited for the Decorative Wrought-Iron Work of one or two bracket balconies, 70 feet by 5 feet, in the new Pension Building.
Drawings and specifications are to be obtained from this office. Proposals opened at noon of 3d December. M. C. MEIGS,
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ENGINES, Automatic and Slide Valve,
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For a profitable investment in a large established Manufacturing Business, centrally located in the city of Chicago, including a Machine Shop, &c., completely equipped with first-class modern tools, a full line of patterns for the best known slide-valve engine in the West; also variable and some automatic cut off engines, and some special tools, all widely and favorably known. Desire to close out the entire business on account of failing health. Includes the good-will and a long lease. A bargain and favorable terms to the right party. Address

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For Sale Cheap.

No. 5¼ Baker Blower; Nos. ½, 2, 5 and 7 Root Blowers; No. 1 McKinzie; Nos. 3, 4, 6, 7 and 10 Sturtevant Blowers; Nos. 2, 5, 33 and 99 do. Exhausters; a Fire Engine; 4 and 6 H.-P Baxter Engine; Ore Crusher; Bogardus Mill; two Sturtevant Disc Exhaust Ventilating Fans, 10 feet diameter. Buyers of machinery will find it to their advantage to correspond with

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FOR SALE.

A complete stock of Hardware Mill Supplies; Iron and Steel; business established 18 years, reason for selling is that I have other business.

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Are prepared to receive **PIG, BAR AND SHEET IRON, LUMBER AND ORE,** Blooms, Ingots, Muck-Bar, Car Wheels, Rails, Machinery, Nails, &c. We also arrange to store **Pig Iron** at Furnaces, **Lumber** at Mills or in Yards, **Ore** on Docks or at Mines. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. Correspondence solicited.

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A brick factory, 55 x 162 feet, with a high basement and two stories; with 40-horse steam power.

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Being engaged in other business, the Plant of the Harrisburg Rivet works, consisting of open and closed Die Rivet Machines, any length or size, with Furnaces, Engine, Boiler, Shafting; can be seen in operation at any time; price $4500; will take half of amount in Rivets. Boilers, or other trade; also Patterns, Flasks and Foundry Fixtures, and Tapping Machinery for pipe fittings. Steam Heating Radiators and Hot Water Radiators; large buildings can be leased for a term of years very reasonable; will also take half of amount in castings and fittings off of same patterns. The business is in operation. This is a rare opportunity to a party that can give their personal attention to the business, which is rapidly growing, having done over $100,000 worth of work for U. S. Government in the last 18 months.
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1 Engine Lathe, 10 in. x 3¼ ft.
1 each, Engine Lathes, 11 in. x 4 and 5 ft.
1 each, " " 13 in. x 5, 6 and 8 ft.
1 Engine Lathe, 14 in. x 5, 6 and 8 ft.
1 " " 16 in. x 6 ft.
1 each, Engine Lathes, 16 in. x 5, 7, 8 and 10 ft.
1 Engine Lathe, 18 in. x 6, 8, 10 and 12 ft.
1 " " 20 in. x 8, 10, 12, 14 and 16 ft.
1 " " 22 in. x 8, 10, 12, 14 and 26 ft.
1 " " 24 in., any length of bed to 26 ft.
1 " " 26 in., " " 26 ft.
1 " " 28 in., " " 46 ft.
1 " " 28 in., " " 28 ft.
1 " " 30 in., " " 28 ft.
1 " " 36 in., " " 29 ft.
1 " " 42 in., " " 38 ft.
1 " " 48 in., " " 29 ft.
1 " " 16 in., x 4, 6 and 8 ft. Rod feed only.
1 each, Turret Lathes, 13 and 14 in. x 5 ft. x 6 ft.
1 Fox Turret Lathe, 12 in. x 6 ft.
1 Fox Lathe, 14 in. x 5 ft. Round Arbor.
1 Fox Lathe, 15 in. x 6 ft. Square Arbor.
1 each, Hand Lathes, 10, 12, 15 and 18 in. swing.
1 Iron Planer, 18 in x 18 in. x 3 ft.
1 each, Iron Planers, 20 in. x 20 in. x 4 and 5 ft.
1 Iron Planer, 24 x 24 x 6 ft.
1 each, Iron Planers, 26 in. x 26 in. x 7 and 10 ft.
1 Iron Planer, 30 x 30 in. x 10 ft.
1 " " 36 in. x 36 in. x 10 ft.
1 each, 16, 20, 22, 23, 26, 28, 30, 34 and 38 in. Upright Drills.
1 each, Nos. 2, 3, 4 and 6 Spindle Gang Drills.
1 each, 8, 10, 12, 15, 18 and 24 in. Shapers.
1 each, Nos. 1, 2 3 and 4 Milling Machines.
1 No. 2 Milling Machine. Lincoln Pattern.
1 New Pattern Milling Machine. Grant & Bogert.
1 each, Nos. 2, 4 & 5 Wire Feed Screw Machines.
1 each, Nos. 3 and 7 Spindle Nut Tapper
1 Boring and Turning Mill, each 10 and 72 in.
1 Gray's Screw Machine, to take all sizes to 1 in.
1 30-in. Gear Cutter
1 Grant & Bogert Cutter Grinder.

SECOND-HAND.

1 Engine Lathe, 15 in. x 6 ft. Wood & Light.
1 " " 15 in. x 6 ft. Chelsea Machine Co.
1 Engine Lathe, 24 in. x 8 ft. Taper Attachment.
1 Planer, 24 in. x 24 in. x 6 ft.
1 " 20 in. x 20 in. x 5 ft.
1 " 50 in x 50 in. x 17 ft.
1 Crank Planer.
1 10-in Shaper.
1 2-Spindle Edging Machine.
2 Lincoln Pattern No. 2 Millers.
1 Bolt Cutter, to take sizes to 1 inch.
1 Second-Hand "Sellers" Miller.
1 " " "Brainard" "
1 " " Universal Miller, good as New.
1 Plain Upright Drill, 30 in. swing, Wood, Light & Co.
1 " " " 20 in. "

All kinds Machinists' Tools and Supplies.

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THE TANITE CO., GRANT & BOGERT MACHINE TOOL WORKS,
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Engines and Boilers.

NEW AND SECOND-HAND.

The following new Slide-Valve Engines guaranteed complete and first class:

One 18 x 30.	One 18 x 24.
One 14 x 24.	One 14 x 20.
One 14 x 18.	One 16 x 24.
One 10 x 24.	One 11 x 14.
One 12 x 16.	One 8 x 16.
One 14 x 18, 2d-hand.	One 12 x 24, 2d-hand.

One Corliss Condensing Beam Engine, 32 x 72, 2d-h.
One 80 H. P. Horizontal Tubular Boiler.

Large stock assorted sizes new and latest improved Engines and Boilers. Come and examine our stock. Plans, estimates and specifications furnished for mills and factories, guaranteeing best results; steam engine indication; cards demonstrated for economy, &c. Send for circular.

NEWELL UNIVERSAL MILL CO.,
10 Barclay Street, New York.

For Rent.

The old-established works of the Easton Lock Co., situated at Easton, Pa. (about 75 miles from New York), consisting of all the Buildings, Machinery, Engine, Lock Patterns, Dies, &c. These works have been in successful operation up to the 1st of June of this year. This is an opportunity seldom offered. The buildings are large and commodious, and the Foundry is one of the most complete and largest in the State. Owing to the death of one of the partners of the Easton Lock Manufacturing Co., is the cause of the works shutting down. Here is a business already established and ready to commence operations at once, as all the machinery is in good working order. For particulars and terms, inquire of

HESS BROS.,
Easton, Pa.

For Sale.

40 H.-P. Horizontal Tubular Boiler, and 25 H.-P. Horizontal Engine; in use six months; all fixtures; will sell very low.

LOVEGROVE & CO.,
152 N. Third St., Philadelphia, Pa.

For Sale, Cheap.

One Horizontal Steam Engine, cylinder 16 x 24, on foundation, with connections as used for driving Nail Factory until August last, by

VAN ALEN & CO.,
Northumberland, Pa.

59 DUANE ST.

We have rented the above-named building in New York City for a salesroom and branch factory, and shall be glad to see all our old friends and patrons, as well as any in need of anything in our line. Dies a specialty.

THE STILES & PARKER PRESS CO.,
Middletown, Conn.

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Hardware Price Book.

Pocket Edition. 240 Pages. Revised and Improved, 1884. One copy, $4.00; three copies, $10.50; six copies, $20.00. Sent, post-paid, to any address on receipt of price by **B. LAMBERSON**, Portland, Oregon; David Williams, 83 Reade St., N. Y., A. F. Shapleigh & Cantwell Hdw. Co., St. Louis, Mo., or William Blair & Co., Chicago, Ill.

Notice

TO THE TRADE.

Being desirous of retiring from business, will offer my entire line of Shelf Hardware, Tinware, Cutlery and Nails at greatly reduced prices.

A. W. WHEELER,
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WANTED.

A man with a good trade wants a situation with a Retail Hardware House, either to sell on commission or salary, or both. "H. L.,"
Office of *The Iron Age*, 83 Reade st., New York.

WANTED.—An experienced Commercial Traveler of ability and character and desirable standing with best Jobbers West desires to correspond with factories in Hardware or Cutlery lines, or special lines or wares. Change of position desired.
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Office of *The Iron Age*, 83 Reade street, New York.

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MACHINERY.

1 Pit Lathe, 105 in. swing. 2d-hand.
1 80-in. x 40 ft. Bed Lathe. "
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18 Engine Lathes, 11 in to 60 in. sw. New and 2d-hand.
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14 Iron Planers, 15 in. to 60 in. wide. New and 2d-h'd.
5 Shapers, 6 in. to 20 in. stroke. " "
1 12-in. and 1 6 in. Shapes. 2d-hand.
3 Power Drill Presses. New and 2d hand.
5 Gang Drills. New and 2d hand.
3 Bench Drills. New.
2 Post Drills. "
1 Suspension Drill. 2d-hand.
2 Heavy Post Drills, 36 in. 2d-hand.
1 Double-Head Horizontal Drill. 2d-hand.
9 Milling Machines. New and 2d-hand.
2 Gear Cutters.
1 48-in. Gear Cutter 2d-hand.
1 Centering Machine.
2 Cutting-off Machines.
2 Nut Tappers.
2 Screw Machines.
1 Cutter Grinder.
9 Emery Grinders, different styles.
1 Surface Grinder. 2d-hand.
1 Pulley Key Seater.
16 Polishing Stands. 2 hand.
1 Steam Hammer, 8 x 18 in. 2d-hand.
3 Shaft Straighteners.
4 Punching Presses
5 Foot Presses.
3 Drop Presses, 400, 800 and 900 lbs. 2d-hand.
6 Power Shears.
2 Bar Iron Cutters, 2d-hand.
1 Filter Press, six plates. Second-hand. Cheap.
1 Lot Headers, Crimpers, Formers, Presses, Dies, &c., for Small Cans. 2d-hand.
Lot Grindstone Frames, Pulleys, Hangers, Chucks, &c., &c.
1 each Nos. 5 and 7 Sturtevant Blowers. 2d-hand.
1 Univ'l Heater, 4 ft x 8 ft. 2d-hand.
1 16 ft. x 30 in. Cylinder Boiler. 2d hand.
1 15 H.-P. Locomotive Boiler. 2d-hand.
All the above at extremely low prices and on favorable terms.

Write and state just what you want.

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For Sale.

One 18 x 42 Putnam Automatic Cut-Off Engine,
One 14 x 24 Cooper Automatic Cut-Off Engine, and several large and small Slide-Valve Engines, second-hand. Also complete stock of new Engines, Boilers, &c. Special bargains in Steam Pumps.

WARREN SPRINGER,
165 to 221 S. Canal st., Chicago, Ill.

For Sale.

After Jan. 1 1885, a clean, neat stock of Hardware, Stoves, Tinware and Stove Fixtures, with Tin and Cornice Shop connected, doing a big business. Have contracted 52 jobs of Cornice in the last six months. Stock is located in one of best business towns in Texas—town of 10,000 inhabitants; has five railroads, street cars, gas and water works, and only 10 years old. Stock will invoice about $10,000. Terms cash.
Address "STOCK No. 1,"
Office of *The Iron Age*, 83 Reade Street, New York.

For Sale,

Stock of Hardware, Stoves and Tinware. Located in best town in Northern Michigan.
Address
"HARDWARE, 124,"
Office of *The Iron Age*, 83 Reade st., New York.

FOR SALE.

THE NARROW GAUGE ROLLING STOCK OF THE PHILA. AND ATLANTIC CITY RAILROAD, consisting of 11 Locomotives, 50 Passenger and Excursion Cars, 20 House Cars, 20 Gondola Cars, and a few Coal and Dirt Dump Cars. Gauge of road 3 feet 6 inches. For particulars, address W. S. WILSON, Pur. Agt.,
227 South 4th St., Philadelphia.

For Sale.

A clean stock of Hardware and Stoves, in one of the best cities of Southern New York. Stock will inventory about $11,000. Population 23,000.
Address "No. 300,"
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

One 50-foot Air Hoist for Blast Furnace, air cylinder 30 inches internal diameter, with necessary sheaves. Will hoist two barrows of stock at once. Apply to

POTTSVILLE IRON AND STEEL CO.,
Pottsville, Pa.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK,
Lock Box 122, New Haven, Conn.

For Sale

At greatly reduced price, the Improved Coal Oil (Kerosene) Vapor Torch. It has given the best satisfaction for past five years. Please send to us for prices and testimonials.

T. R. LOOMIS,
Cazenovia, N. Y.

For Sale.

A Small Machine Shop, first-class tools, manufacturing several first-class specialties. Will sell contents of shop, business and the patents, at a great bargain. Address

"MACHINE,"
412 Arch Street, Philadelphia.

For Sale.

File factory, 30 miles from New York, fully equipped for manufacturing Hand-Cut Files. Engine, Boiler, Tools, &c., complete Apply to

CHALMERS & MURRAY,
76 Reade St., New York.

Wanted.

Second-hand Shears to cut Rails. Must be strong, heavy shears, complete, and in good condition. State lowest price and where they can be seen. Address

612 Fifth Ave., Pittsburgh, Pa.

NOTICE.—The undersigned, having a thorough and practical knowledge of the Bar Iron and Steel Trade, is now open for an engagement. No objection to other business. Correspondence solicited References from the trade and others.
Address "S."
Office of *The Iron Age*, 83 Reade St., New York.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, TUESDAY, November 25, 1884.

Scotch Pig.—The market is a little weaker. We quote makers' brands as follows:

Coltness, alongside, Glasgow			59/
Langloan,	"	"	58/
Gartsherrie,	"	"	55/6
Summerlee,	"	"	54/
Carnbroe,	"	"	50/6
Glengarnock,	"	Ardrossan	50/6
Eglinton,	"	"	45/
Dalmellington,	"	"	48/6
Shotts,	"	at Leith	54/6

Lighterage from Ardrossan to Glasgow is 1/ per ton.

Cleveland Pig.—The market is unchanged. We continue quotations, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry		41/
" No. 2 "		39/
" No. 3 "		37/ @ 37/6
" No. 4 Forge		36/

Bessemer Pig—Is unchanged. W. C. Hematites are quoted 44/ @ 44/6 for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is irregular. We quote at works:

	£	s.	d.	£	s.	d.
Staff. Ord. Marked Bars	7	10	0	@	.....	.
" Medium "	6	0	0	@	6 10	0
" Common "	5	10	0	@	5 15	0
Hoops, 20 W. G. and over.						
" Common Best	6	15	0	@	.....	
" Medium	6	5	0	@	6 10	0
" Common	6	0	0	@	6 7	6
Sheets, 20 W. G. and under.						
" Ordinary Best	7	15	0	@	8 5	0
" Common	7	5	0	@	7 15	0
Welsh Bars	4	17	6	@	5 2	6

Steel Rails—Are unchanged. We quote £4. 17/6 @ £5, f.o.b. shipping ports.

Copper.—The market is weaker. We quote Best Selected, £57. 10/ @ £58. 10/, and Chili Bars, £51. 15/ @ £52. 5/.

Tin—Is a little firmer. Straits Ingots, spot, £75 @£75. 10/, and futures, £75. 5/ @ £76.

Tin Plates—Are steadier. We quote:

Tin Plates, 10x14, 1st qual. Charcoal				19/6 @ 21/6
" " 2d " "				18/6 @ 19/
" " 1st "	Coke			17/6 @ 18/
" " 2d " "				14/6 @ 15/

Spelter—Is unchanged. We quote Ordinary, at shipping ports, £14. 5/ @ £14. 7/6.

Lead.—The market is quiet. We quote Common English Pig, £10. 15/ @ £11.

Freights.—Steam from Glasgow to New York, 2/6 @ 3/; Liverpool to New York, 5/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

Financial.

Office of *The Iron Age*,
TUESDAY EVENING, November 25, 1884.

The extreme dullness succeeding election week has been relieved by more animation in speculative circles, and in trade generally there is some improvement, but the revival is far from satisfactory, and cannot be while our manufacturing interests remain so prostrated as now. Notices of a shortening of time and of reduced wages are increasingly frequent—in some instances not until manufacturers have accumulated goods far beyond current requirements for consumption. And yet in several departments, such as State produce, grain and coffee, there are more favorable indications. Of the former it is reported that shipments consigned to our merchants are more readily sold than one year ago, and in grain the augmented freight engagements on foreign account give promise of more liberal exports. Provisions continue weak, and the increasing receipts of corn, attended with a lowering of prices, serve to unsettle the market, both here and at the West. In dry goods trade among jobbers is invariably dull between about the 20th of October and the 20th of January, but it is remarked that of late there exists among buyers more disposition to provide for future wants than was manifested a short time ago. Coffee has improved about ¼¢, compared with the lowest of recent sales, stimulated in part by buying on European account. In the cotton market quotations show a gain of ¼¢@ 1¢ within a month, while prices for manufactured goods show something like a corresponding decline. Lard oil is lower; spirits of turpentine higher. Taking all together, values have undergone no special change. The exceptions are cotton and wheat, the former advancing, while the latter recedes. The frequency of failures in various parts of the country is one of the most discouraging features, engendering distrust. The number reported last week for the United States was 248, and for Canada 29, or a total of 277, as against 236 for the previous week. The increase is mainly in the Southern and Western States. The exchanges of 27 leading clearing houses in the United States last week aggregated $800,768,500, against $651,875,199 same week last year. Increase, 15.8 %. Outside of New York, $245,057,100. against $269,423,796; decrease, 9 %.

On the Stock Exchange movements have been irregular and for the most part confined to a few leading specialties under clique manipulation. Conflicting rumors respecting the trunk line situation were the principal source of disturbance, but a ground of assurance is found in the probability in regard to freights that rates are likely to be more firmly held now that navigation on the lakes and canals is virtually closed. On Thursday values fell of ½ @ 2 %, the market closing weak. The Vanderbilts and grangers most felt the pressure. On Friday the latter improved and the market was stronger at the close, notwithstanding a break in Rock Island, and Lake Shore was steadily pressed for sale on account of doubts respecting the next dividend. On Saturday and Monday there was no marked feature aside from the excessive dullness. The usual dividends of 3½ % semi-annually and 2 % quarterly were declared on Northwest common and preferred. The Erie report, showing a decrease of more than $2,000,000 in net earnings for the past year, had little effect, having in its general features been anticipated, President Jewett sent in his resignation. To-day was without special occurrence, trading being small in amount and on a higher range, but without significant change. Quotations are as follows: Delaware and Hudson, 90; East Tennessee, 4¼; Kansas and Texas, 16; Missouri Pacific, 93½; Pacific Mail, 52⅝; Rock Island, 109; Texas and Pacific, 12; Jersey Central, 41⅝; Northern Pacific, preferred, 40⅝; Oregon and Transcontinental, 12⅞; Lackawanna, 109¼; Lake Shore, 67; Erie, 13¼; New York Central, 83⅛; Northwestern, 89¾; Northern Pacific preferred, 40⅝; St. Paul, 77⅜; Union Pacific, 59⅜; Western Union, 60½; Burlington, 119⅜.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	101¼	—
U. S. 4½s, 1891, coupon	114¾	—
U. S. 4s, 1907, coupon	122½	122⅝
U. S. Currency 6s, 1895	128	—
U. S. Currency 6s, 1896	129½	—
U. S. Currency 6s, 1897	131	—
U. S. Currency 6s, 1898	133	—
U. S. Currency 6s, 1899	134	—

The imports of foreign merchandise at this port during the past week were moderate, but still $872,811 in excess of those of the previous week. The total was $6,871,765, of which $5,311,938 was general merchandise and the remainder dry goods. Since January 1 the total is $384,621,380, compared with $415,490,821 for the corresponding period of 1883. The export statistics of the week are not yet complete. The total dry goods imported since January 1 is $105,497,590, which is a decrease of $7,170,514 for the same time in 1883. According to the Custom House reports the imports of specie for the week were $2,050,803, nearly all in gold, making a total of $27,793,379 since January 1. This amount does not include $1,150,000 received by the Bremen steamers on Saturday. The exports of specie for the week were $261,619, of which $200,000 was in silver, making a total of $50,279,526 since January 1.

The market for sterling exchange has further advanced, the posted rate now standing strong at $4.82 @ $4.86. Canadian banks, including the Bank of British North America, have advanced their rates ½¢ ₱ pound sterling Few commercial bills are offering, the decrease being principally in cotton and provision bills, but there is a demand for sight drafts on reported sales of securities in this market. The weekly bank statement shows a gain of $2,771,525 in surplus reserve, which now stands at $40,246,050, against $5,283,900 at the same time last year. The most noticeable features of the exhibit are a further increase of $2,904,200 in cash and a contraction of over $3,000,000 in loans. The addition to the specie average was due chiefly to the arrivals of gold from Europe. As seen from the statement of the Associated Banks, money continues stagnant, with a further accumulation at this center. Call loans are nominally 1½ %; indorsed bills receivable, 5 @ 5½ %; four months' acceptances, 5½ @ 6 %. In Chicago the demand for money is about as usual. Each month the Government is paying out gold for the purchase of about $24,000,000 silver, to be coined and added to the accumulation in the Treasury, which has now risen to $177,000,000. Against this there are outstanding about $100,000,000 silver certificates. The addition of these to the circulation only tends to promote the hoarding of gold and to prevent its free circulation. The unaccountable disappearance of gold is one of the problems of the day. Although more than $14,000,000 were added to the circulation last year above what was exported and consumed in the arts, the amount in sight—that is, in the Treasury and in banks—is nearly $6,000,000 less than one year ago. The recent decline in the value of fine silver to 49⅝d. ₱ ounce in London and $1.07½ here is the lowest price touched in some time. About eight years ago it fell temporarily to 46½d., the lowest in at least 50 years. The price soon recovered from that extraordinary low point, and has been 50d. and upward for most of the time since. The cause of the present decline in the metal is attributed mainly to depression in China, where the recent large demands for fine silver have wholly ceased.

By the action of the Tariff Committee of the French Chamber of Deputies, in approving the principle of increased import duties on corn and flour, it appears probable that France is fast preparing to protect her agricultural interest against American competition. The French Minister of Agriculture is an advocate of the measure, also the Council of State. The duty proposed by the Société Agriculteur is 5 francs on wheat and 15 francs on salted meats ₱ 100 kg.

The Government has begun its suit against the Union Pacific for $1,700,000 in the Court of Claims, and the United States Court at Trenton granted a preliminary injunction restraining the Jersey Central from issuing bonds to the Reading Company.

The Metropolitan Bank is receiving no deposits and its affairs are being liquidated as rapidly as possible. The depositors will be paid in full, but the stockholders will probably not receive much over $25 per share. The security which the Clearing Houses holds for the $5,000,000 it advanced to the bank is said to be $20,000,000 (par value) stock of the East Tennessee, Ohio Central and Richmond and Alleghany stock.

The Atlantic State Bank, of Brooklyn, paid another dividend of 20 %, leaving $350,000 still due to depositors.

New York Iron Market

While considerable diversity of opinion is encountered among the members of the Iron trade respecting the future, there seems to be but one expression as to the present. It is perfectly agreed upon all hands that trade is exceedingly dull. Those whose views are colored to some extent by their political feelings either predict very dull times and much lower prices, or else a continuance of dull trade for a short time, to be followed by much better business within a reasonable period. The condition of affairs has changed very little from that reported a week ago. It was apparent then that quotations of Iron were almost wholly nominal, and that parties who wished to realize would be obliged to make some sacrifices in order to find purchasers. This seems to be the case to-day. Although nobody is suffering from an accumulation of stock, either to use or to sell, at the same time there seems to be a strong disinclination to lay in additional stock, very little confidence existing in the stability of even present prices. The market, therefore, seems to be sadly deficient in the buying element. Until this is more strongly represented the outlook will continue to be unsatisfactory, if not very gloomy.

American Pig.—The sales of standard brands of Lehigh Irons have been very limited during the week. The fact is apparent that consumers do not feel disposed to pay the prices asked for Lehigh Irons when they can get outside Irons considerably cheaper, even though the quality may not be quite so good. From many sources, however, we understand that considerable Iron is quietly being placed, these outside Irons being pressed upon the market at terms sufficiently low to induce consumers to take hold of them. While the manufacturers of standard Irons and their representatives feel that the movement toward outside Irons is merely a temporary phase of the market, and are not inclined to believe that it will prove to be at all permanent under ordinary conditions, at the same time the fact of its present existence is very annoying to them, and different schemes are discussed for correcting it. A general cut-down in the price of standard Irons would undoubtedly be efficacious, but as some of these Irons are now being sold in sufficient quantity to tax the capacity of the furnaces producing them, and such manufacturers consequently feel very firm in their views, it is somewhat difficult to inaugurate a general movement in this direction. Some suggest that it might be well to withdraw entirely from the market and permit the manufacturers of these outside Irons to fill up with orders for future production at present prices. If this could be done it would undoubtedly soon have a decidedly beneficial effect upon prices, as the outside furnaces could not evidently supply a very large demand, and, after they had filled up, the main body of consumers of Pig Iron would be obliged to look about them pretty sharply in order to secure stock. There are representatives of the manufacturers of standard brands who say that, no matter what prices may be made for outside Irons, they propose to keep their entire trade. A lively time is, perhaps, in prospect for the first of the year. In the meantime matters are fluctuating with the efforts of outside parties to get orders, and prices are wholly nominal, depending upon the terms which each buyer can make with the parties from whom he is purchasing. We continue to quote as follows for best Lehigh and North River brands, tidewater delivery: No. 1 X Foundry, $19 @ $20; No. 2 X Foundry, $17.50 @ $19, and Gray Forge, $16 @ $17 50. Outside Irons, about $1 cheaper.

Scotch Pig.—The arrivals of Scotch Pig during the past week were about 1100 tons, the quantity arriving weekly varying but little. New business is very slight, and importers feel decidedly discouraged over the outlook. Occasionally a lot is sold at low prices from dock, and one or two brands go into store as they arrive, agents being unwilling to sell them at present prices. Tramp steamers are now making their way here in quest of cargoes for European ports, and they are offering to bring Scotch Pig this way at unusually low rates. Under present circumstances, however, importers hesitate to take any risk of the market, and even nominal freights are not tempting. Large lots and lots on dock are offered at concessions from our quotations, which are as follows for small quantities: Coltness, $22 @ $22.50; Gartsherrie, $21 to arrive, $22 from yard; Shotts, $21.50 @ $21.75 to arrive, $22 from yard; Langloan, $21.50 to arrive, $22.50 from yard; Carnbroe, $20.50 to arrive, $21 from yard; Glengarnock, $20.50 to arrive; Summerlee, $21 to arrive; Dalmellington, $20 to arrive; Eglinton, $19.25 @ $19.50 to arrive; Clyde, $20 to arrive.

Bessemer Pig and Spiegeleisen.—The quotations for foreign Bessemer are again somewhat easier under the low freights offering from the other side, and it is possible that $19 could be shaded. At present there are no inquiries in the market except for small lots of special brands for particular purposes, which are held higher. We are reported no transactions in Spiegeleisen, for which $27 is still quoted for 20 %.

Bar Iron.—The demand for mill lots has been quiet, and there are no new developments as to prices. A hand-to-mouth trade is being done, with strong competition from sellers. Quotations for Best Refined at mill are 1.65¢ @ 2¢; from store, 1.9¢ @ 2.2¢; Common Iron at mill, 1.45¢ @ 1.7¢; from store, 1.7¢ @ 2¢.

Structural and Shaped Iron.—The lot of Beams which we reported last week as having been sold here are to be made of Steel. A considerable quantity of such Beams has been placed in this market during the season just closing. Quotations for small lots of Structural Iron are as follows: Angles, from store, 2.3¢ @ 2.6¢; Tees, from store, 2.9¢ @ 3¢; Beams and Channels, on dock, 3.5¢. For large lots these prices would be shaded very considerably.

Plates.—The demand for Plates has not been strong, and the lots sold have been very small in size. Quotations for ordinary lots of Iron Plates are as follows: Common or Tank, 2¼¢ @2.3¢; Refined, 2½¢; Shell, 2¾¢; Flange, 3¼¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates quotations are as follows: Tank, 3¼¢ @ 4¢; Boiler, 4¼¢ @ 5½¢.

Sheet Iron.—There is no change to note from the condition of trade as reported within the last two weeks. The demand is quiet, with no signs of improvement in prices. Quotations will be found in our New York wholesale prices.

Merchant Steel.—Transactions in this line are few in number and of a retail Character. Quotations continue entirely nominal, ranging about as follows: American Tool Steel, 9¢ @ 9½¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 5¢ @ 6¢; Spring and Tire, 3¢ @ 3¼¢; Open-Hearth Machinery, 3¢ @ 3¼¢; Bessemer Machinery, 3¢; English Tool, 14½¢ @ 15¢.

Steel Rails.—Transactions in Steel Rails during the past week amounted to about 19,000 tons, consisting of several lots, the largest being one of 9000 tons. Considerable competition has taken place among the mills for some of the business that was recently offered, and prices, consequently, have receded somewhat from the quotations which have obtained during the past three or four weeks. It was supposed that the mills would hold their prices firmly in view of the fact that they had secured a fair supply of orders for the winter. This, however, does not seem to be the case, as has been demonstrated by this recent transaction. The range of prices now may be quoted at $27 @ $29 at Eastern mill. The orders in sight are not very numerous, but it is expected that some large orders will be placed during the course of the winter.

Steel Wire Rods.—No new business is reported under this head, quotations ranging from $44 up, according to time of delivery and size of order.

Old Rails.—No inquiries are reported, and few lots are offering. In the absence of sales we quote nominal prices $16.50 @ $17.

Scrap Iron.—The only sales which have come to our knowledge during the week are two of about 300 tons each. These are sales by outside parties, and realized prices slightly under those asked by yard dealers. The quotations of No. 1 Wrought Scrap from yard are $18.50 @ $19. Some dealers ask $20 for very carefully-selected Scrap, but at this price find no takers.

Coal.

The Anthracite Coal trade is moderately active, with the advent of colder weather. The demand for Stove is decidedly better, and Egg is somewhat improved, but Steam sizes drag as before. Lehigh Coal occasionally touches the prices agreed upon last March, viz.: Lump, $5.25; other sizes about $4.25, and is generally satisfactory to producers, but, as no Lehigh circulars are published, current prices can only be approximately quoted. Free-burning Coals of the ordinary description are still struggling under excessive production, with the price circulars badly demoralized, but improving slowly. Another suspension takes place with the beginning of December. It is intimated that in governing the output for the coming year the percentage system will again be up for discussion. Quotations range about as follows: Stove, f.o.b.: $4.10 @ $4.25; Egg, $3.60 @ $4; Broken, $3.50 @ $4; Chestnut, $3.50 @ $3.75; Pea, $2.25 @ $2.50.

Bituminous Coal is good supply, and selling so low that prices can only be quoted in a general way at $3 @ $3.25, f.o.b.

The total amount of Anthracite mined thus far in the year 1884 is 26,023,172 tons, compared with 28,150,546 tons for the same period last year. The total amount of Bituminous sent to the Eastern markets thus far in the year 1884 is 4,855,397 tons, compared with 4,434,572 tons for the corresponding period last year.

Notice has been given the employees of the Palmer Wire Mills, of Palmer, Mass., that work can be furnished them only three days in a week, and that to a slightly reduced force.

Trade Report.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, November 25, 1884.

Pig Iron.—A very unsettled feeling has prevailed during the past week, and it is difficult to say with strict accuracy what the ruling prices are. The tendency is toward lower figures, however, and it is probably a question of a very few days before a general revision of quotations will have to be made. Some prominent parties express the opinion that the volume of business will be no larger at $1 ℔ ton reduction than it is at present prices, and there is no reason to doubt this statement, but it is becoming a question of the "survival of the fittest." Some of the oldest and strongest companies have been pretty well crowded out of the market of late, and the indications are that they will be out entirely unless their prices are made to conform to the changed condition of affairs. Brands of Iron very little known heretofore have been taken because of their apparent cheapness, and during the past two or three weeks a large proportion of the receipts have been of this class. It is probable, however, that the supply is only temporary, but as a protective measure, at least, some of the Pennsylvania companies announce themselves as determined to hold their trade at all hazards. In this way a wide range of prices prevails, say from $19 to $20 for No. 1 Foundry, with the majority of sales at from $19 to $19.50, and in some cases less than $19 has been quoted for good Iron. Buyers cannot always select their brands at $19, but there is an abundance of good Iron to be picked up at that figure, and on firm offers for good-sized lots $19 in some cases could be shaded. No. 2 Foundry is dull and has been pressed for sale at $17.50 @ $18, but the demand is slow and uncertain. Mill Irons are moderately active, but at irregular prices, the extreme range being $16 @ $17, delivered, for what may be classed as up to the usual standard of quality. Still lower prices are quoted for Southern Irons, but, as the quality is more or less a question of doubt, quotations give no very definite idea as to the actual value. On the whole, it is probably safe to assume that $16.50, delivered, is a fair average quotation for a good quality of Mill Iron, $18 for No. 2 and $19 @ $19.50 for No. 1, although in exceptional cases sales have been made both above and below these figures, according to quantity, character of brand and similar considerations.

Foreign Iron.—Bessemer dull and neglected. Speigeleisen has been sold to the extent of 6000 to 8000 tons, but at extremely low figures. Prices are not definitely known, but as there are free offerings at a fraction over $22 for 10 to 12 %, and at $26.50 for 20 %, it is not likely that these figures were exceeded, and may have been slightly shaded.

Muck Bars.—There is very little demand, and to effect sales in quantity lower prices would have to be accepted. Small lots have been taken at $28 @ $28.50 at mill, but at the moment the market is very uncertain.

Blooms.—There is no demand worth naming, although last week's prices are generally asked, as follows: Charcoal Blooms at $52 @ $53; Run-out Anthracite, $43 @ $44; Scrap Blooms, $35 @ $36; Northern Ore Blooms, $35.

Bar Iron.—The demand shows no improvement, and business is as dull as it has been at any time within the past 12 months. At this late season, however, improvement cannot be expected, and manufacturers will be satisfied to maintain their *statu quo* during the balance of the year. Prices are nominally 1.8¢ for Best Refined Bars, but on large lots extras are sharply cut, so that a good deal of business is done at less than card rates. Common and Medium quality Bars are quoted at from 1.5¢ to $1.65, but there is very little inquiry for that class of Iron.

Plate and Tank Iron.—Nothing new has been developed during the week, and the general position is, as before, dull and inactive. A fair sprinkling of orders for small lots of Plates have been sent in, but not more than sufficient to offset the output, which is little, if anything, beyond one-half of the full capacity. No improvement is anticipated during the balance of the year, although there is some reason to expect a moderate receipt of orders for delivery early in 1885. Prices are easy, and in most cases are for lots delivered in consumers' yards, as follows: Plate Iron, 2.1¢; Tank, 2.15¢ @ 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢; Steel Plates, Flange, 3.5¢ @ 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—Business is very quiet, and mills running lighter than they have done for months past. Two or three orders are on the market, however, and it is probable that a few thousand tons will be taken for 1885 delivery, but there is very little chance of any coming in for this year's delivery, except in a very small way. Prices rather weak and unsettled, but nominally as quoted before, viz.: 2.1¢ for Angles, 2.25¢ for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—Market very dull, and only small lots taken at about the following prices for best makes, viz.:

Best Refined, Nos. 26, 27 and 28	3¼¢
Best Refined, Nos. 18 to 25	3½¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	5.5¢
Best Bloom Sheets, Nos. 22 to 25	5 ¢
Best Bloom Sheets, Nos. 16 to 21	4¾¢
Common Red Plates, 3-16 to 16	2½¢
Blue Annealed	2.6¢
Best Bloom, Galvanized, discount	52½ %
Second quality, discount	55 %
Common, discount	57½ %

Wrought-Iron Pipe.—The demand is chiefly for steam-heating purposes and keeps up fairly well for the season. Prices show no signs of improvement and are as irregular as before. We quote as follows: Butt-Welded Black Pipe, 45 %; Butt-Welded Galvanized, 30 @ 35 %; Lap-Welded Black, 60 @ 65 %; Galvanized, 40 @ 45 %; Boiler Tubes, 60 %.

Steel Rails.—There is a moderate inquiry from week to week, and the mills appear to be entering orders somewhat in excess of deliveries. Prices are steady, with $28 at mill as the usual quotation, and from that down to $27.50 for orders desirable as to quantity and time of delivery. The outlook is fairly encouraging, and prices likely to be held at about the figures now quoted.

Crop Ends.—There is some inquiry, and bids of $18.50 made for 1000-ton lots West of England makes. Sellers ask $19.50, however, and appear to be firm at about that figure.

Steel Blooms and Slabs.—Sales reported at last week's quotations, viz.: Nail Blooms (Foreign), $33 @ $34 at tide, and $37.50 @ $39 for Soft Basic Blooms for special uses. Domestic Slabs are quoted from $33.50 to $35 at mill, according to quality. Bessemer Nail Blooms, $32 @ $32.50, delivered.

Nails.—The mild weather has enabled builders to continue operations longer than usual, and the Nail season has been prolonged thereby. The close is near, however, and the market is less active. Steel Nails are a trifle hard to move at any advance over Iron, but are generally preferred when they can be obtained at the same figure. Prices are tolerably firm, although varying with size of lot, &c.; $2.05 is the general price for ordinary-sized lots, and $2 seems to be the bottom figure under any circumstances.

Old Rails.—The demand is somewhat irregular, but, on the whole, prices not quite as firm as they were. Sales at $17.50 @ $18, Philadelphia, are reported, and at $18.50 @ $19 at interior points.

Scrap Iron.—A fair demand is reported, chiefly from mills in the interior. For Philadelphia deliveries prices are about as follows: Railway Scrap, No. 1, $19 @ 19.50; Ordinary No. 1, $18 @ $18.50; Wrought Turnings, $15; Pipe Ends, $17; Burnt Iron, $10.25; Cast Scrap, $14, and Cast Iron Turnings, $9.50.

Chicago.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of November 24, 1884: *Pig Lead*—This market has declined to $3.20, under sales of some 200 tons to local consumers, and closes quiet, though firm, at $3.20, asked. There is considerable inquiry noticeable, especially for future delivery, but as yet we hear of no business being done except in a small way. We are now entering a season when manufacturers let the stocks of Pig run down, so during the next six weeks we look for a very quiet market, and, unless speculators take hold of Lead we think prices will be steady at and around present values.

Cincinnati.

NOVEMBER 24, 1884.—*Pig Iron.*—Consumers in every quarter complain that no new orders come in, and that none are in prospect. This comes from the whole line of rolling mills and foundries from the largest to the smallest. The decision seems to be universal to delay purchases till necessity compels. During the past week Tennessee and Alabama brands Charcoal and Coke have been furnished to consumers not in immediate want, and lower prices than any yet quoted are reported as having been used. The Standard Hanging Rock, Eastern Ohio and West Pennsylvania brands are quotable as before, and a fair retail trade:

CHARCOAL FOUNDRY.		
Hanging Rock, No. 1	$21.00 @	....
Hanging Rock, No. 2	20.00 @	....
Tennessee and Alabama	17.50 @	19.50
Lake Superior	22.00 @	22.50
COKE FOUNDRY.		
Pennsylvania and Eastern Ohio, No. 1	20.00 @	....
Pennsylvania and Eastern Ohio, No. 2	19.00 @	....
Hanging Rock, No. 1	19.25 @	....
Hanging Rock, No. 2	18.00 @	....
Virginia, Tennessee and Alabama, No. 1	18.00 @	....
Virginia, Tennessee and Alabama, No. 2	16.50 @	....
SILVER GRAY SOFTENERS.		
Hanging Rock, No. 1	19.25 @	....
Hanging Rock, No. 2	17.50 @	....
Others from $1 to $2 less.		
FORGE.		
Charcoal Coke and Stonecoal	15.00 @	20.00
CAR WHEEL.		
Hanging Rock, Cold-Blast Charcoal	27.00 @	29.00
Hanging Rock, Warm-Blast Charcoal	20 00 @	21.00
Lake Superior, Warm Blast Charcoal	22.00 @	23.00
Alabama Warm-Blast Charcoal	24.00 @	25.00
SCRAP.		
Cast	12.00 @	15.00
Wrought	14.00 @	17.00

Louisville.

W. B. BELKNAP & CO., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of November 24, 1884, report as follows: We are glad to report more animation in trade generally. It is rather noticeable, however, in Hardware than in the heavier goods, for, despite a fair seasonable demand, the prices on *Bar Iron* are still lower than we have had occasion to quote them for some time. There seems to be absolutely no recuperative power to the article whatever. Some of the mills which carried stocks over the election, in hopes of higher prices, are closing out such stocks, and have announced their intention not to start until something better may be realized. Pretty much all hope of improvement until after the 1st of January has been abandoned, and a quiet resignation is settling down over the situation. There is no doubt, however, that the result of the election will encourage new enterprises in the South, as such efforts naturally accompany good spirits. Men will pay their debts more promptly, even though they have no more money to pay them with than before. *Hoops and Bands* are weakish, and prices somewhat irregular. We do not know whether the bond of the old association is claimed to be as strong as it used to be, but there are certainly evidences of elasticity which formerly did not characterize it. Prices for Hoops are much lower than they were in 1879, when it was presumed the bottom had dropped out of everything. *Sheet Iron.*—There is decidedly more movement in the Stove-Pipe and Pan gauges, though the individual orders are small. This is incident to the first spell of cool weather that we have had. Large stocks of it were manufactured early in the season and carried both by mills and jobbers until they were heartly sick of it and glad to let it go at low figures. Several of the mills advise us they have not adopted the new gauge, but furnish 26 and 27, as heretofore, by the regular Birmingham standard. *Nails.*—The situation of Nails grows more interesting as prices decline to what is necessarily nearer bottom. The war a short time ago between Iron and Steel Nails is now assuming larger proportions in the Steel-Nail camp itself. Almost all of the Wheeling and other river factories announce themselves prepared to furnish Steel Nails to their customers, and caution buyers to see that they get the "blue" or the "red" brand, as the case may be. Orders are daily increasing for Steel Nails, but, if the kind of Nail Plate is furnished those factories which do not make their own as was recently described to us by one of the large Steel-makers, we shall expect to hear a good deal of complaint of Steel Nails themselves. On inquiring how it was possible there should be such a discrepancy in the price of Plow Slab and Nail Plate, when the temper of the latter must of necessity be even, neither too hard nor too soft, that it should be transported several hundred miles, cut up into Nails, put into a 12½¢ keg and delivered several hundred miles distant from the factory, all at a trifle over $2, with the 2 % trade discount, we are answered as follows: "The new industry of furnishing Nail Plate to the Nail mills furnished a most acceptable outlet for what otherwise went into the Scrap pile. It does not pay to reroll it into Nails, nor yet into Plow Plate, for with the first the waste is too great and in the second the slivers show too plainly to be available for Plow Shapes, but when cut up the imperfections are too small to be noticed in a single Nail." *Barb Wire.*—The price of Wire is very much disturbed by the extreme dullness of the market and the efforts on the part of many of the manufacturers to unload. If we have a fair, open winter there will be an immense amount of fencing put up, but, if the weather be bad, trade will drop off still further. The weather in the cotton States has lately been so propitious that all hands have been employed in picking cotton; hence ginning and shipping are delayed. It is coming out this year in admirable condition, and, owing to late advances in price, promises to be remunerative, and as soon as sales begin an easier money market is looked for. Among the first signs of advances we may note that of Carriage Goods manufacturers. These goods have been absurdly low for six months past, and the new circular of prices may indicate the turning point in other lines as well.

GEO. H. HULL & CO., Commission Merchants, report to us as follows, under date of November 24, 1884: The market has been very dull for the last week, but prices remain firm. We quote for cash, in round lots, as below:

PIG IRON.		
Southern Coke, No. 1 Foundry	$17.50 @	$ ....
" No. 2 "	16.25 @	16.50
Hanging Rock Coke, No. 1 Foundry	18.00 @	18.50
Hanging Rock Charcoal, No. 1 Foundry	21.50 @	23.00
Southern Charcoal, No. 1 Foundry	18.00 @	19.00
Silver Gray, different grades	15.00 @	17.00
Southern Coke, No. 1 Mill, Neutral	14.75 @	15.00
" No. 2 " "	13.75 @	14.00
" No. 1 " Cold-sh't	14.00 @	14.50
Southern Charcoal, No. 1 Mill	16.50 @	17.50
White and Mottled, different grades	12.50 @	13.50
Southern Car-Wheel, standard brands	25.00 @	26.00
Southern Car-Wheel, other brands	22.00 @	24.00
Hanging Rock, Cold-blast	26.00 @	26.00
" Warm-blast	21.00 @	22.00

St. Louis.

HOFFER & CO., of St. Louis, report to us as follows, under date of November 24, 1884: There is nothing doing in the Iron market, and we continue quotations same as last week:

CAR WHEEL AND MALLEABLE IRONS.	
Missouri	18.00 @ 20.00
Southern	26.00 @ 27.00
Ohio	28.00 @ 30.00
HOT BLAST CHARCOAL IRONS.	
Missouri	$16.00 @ 17.00
Southern	16.00 @ 17.00
Ohio	20.00 @ 22.00
COAL AND COKE IRONS.	
Missouri	16.00 @ 17.00
Southern	18.00 @ 19.00
Ohio	20.00 @ 22.00
MILL IRONS.	
Red-short	15.50 @ 16.00
Neutral	15.00 @ 16.00

Imports and Exports.

IMPORTS.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Nov. 25, 1884:

Hardware.

Baldwin Ch.
Gun barrels, cs., 8
Boker Hermann & Co.
Hdw., cutlery and guns, pkgs., 41
Curley Bros.
Mdse., case, 1
Drexel, Morgan & Co.
Arms, cs., 17
Field Alfred & Co.
Guns, cs., 4
Packages, 2
Casks, 2
Graef Cutlery Co.
Cutlery, cs., 3
Great Western Dis. Co.
Arms, cs., 9
Machinery, pkgs., 19
Josepthal Bros.
Cases, 12
Round A.
Nails, basket, 1
Schoverling, Daly & Gales,
Mdse., cs., 10
Wiebusch, Hilger & Co.
Hdw. and cutlery, pkgs, 32
Wright Peter & Sons,
Machinery, pkgs., 2
Order,
Cutlery, case, 1
Machinery, pkgs., 4
Machinery, cs., 7
Fire grenades, bxs., 50

Iron.

Baltzer & Lichstenstein,
Rods, pkgs., 997
Baring Bros. & Co.
Bars, 2144
Brown Bros. & Co.
Wire, coils, 318
Crocker Bros.
Spiegel, tons, 483
Crossman W. H.
Car wheels, 120
Drexel & Morgan,
Rivet wire rods, coils, 1104
Field Alfred & Co.
Wire, bdls., 3
Irwin Richard & Co.
Pig, tons, 300
Lalance & Grosjean
Mfg. Co.
Sheets, bdls., 490
Lazard Freres,
Wire rods, pkgs, 6
Fence wire, pkgs., 955
Naylor & Co.
Rivet wire rods, coils, 2217
Wire rods, coils, 340
Bars, 2213
Spiegel, lot, 1
Stetson Geo. W. & Co.
Pig, tons, 550
Tillotson L. G. & Co.
Gal. wire, coils, 105
Weighman Bros.
Iron works, case, 1
Williamson Jas. & Co.
Pig, tons, 100
Order,
Spiegelsen, tons, 200
Wrought beams, 101
Rivet wire rods, coils, 345
Wire rods, bdls, 665
Beams, 341
Rods, pkgs., 26,308
Wheels, 4
Tires, 2
Wire, pkgs., 121
Wire rods, coils, 23,054

Steel.

Alexandre, F. & Sons,
Chests of steel, 20
Appleton D. & Co.
Stereo. plates, cs., 3
Baring Bros. & Co.
Wire coils, 11,750
Brown Wm.
Bundles, 91
Cases, 9
Hammacher A. & Co.
Wire, cs., 6
Hernshenn Tansen,
Wire coils, 530
Lazard Freres,
Wire, pkgs., 1616
Morton, Bliss & Co.
Bars, bdls., 43
Naylor & Co.
Old leaf spring, tons, 46
Temple & Lockwood,
Packages, 32
Bar steel, pcs., 2
Wagner W. F.
Bars, 90
Bundles, 57
Plates, 16
Wolff R. H.
Rails, bdls., 118
Order,
Forgings, 170
Bundles, 165

Metals.

Aikman Jas. & Co.
Tin plts., bxs., 406
Bache Semon & Co.
Tin leaves, cs., 7
Bruce & Cook,
Tin plts., bxs., 2892
Carter, Hawley & Co.
Tin, slabs, 535
Crooks Robert & Co.
Tin plts, bxs., 6364
De Mill L. R. & Co.
Tin plts., bxs., 411
Dickerson, Van Dusen & Co.
Tin plts., bxs., 3960
Tin and terne plts., bxs., 48
Tin ingots, 192
Hendricks Bros.
Lead, pigs, 954
Hunt J.
Lead tubing, cks., 13
Jex Wm. & Co.
Old copper, cs., 3
Ketcham E. & Co.
Tin plts., bxs., 1032
Montell & Sons F. T.
Old metal, bxs., 9
Naylor & Co.
Tin plts., bxs., 1368
Phelps, Dodge & Co.
Tin plts., bxs., 8244
Pim, Forwood & Co.
Gun shells, cs., 20
Reid John,
Baths and sinks, pkgs., 65
Schoverling, Daly & Gales,
Cartridges, &c., cs., 11
Scoville Mfg. Co.
Mdse., cs., 10
Shepard Sidney & Co.
Tin plts., bxs., 1519
Strauss A. D. & Co.
Old metal pipes, 25
United Brass Co.
Mdse., cs., 4
Order,
Tin plts., bxs., 40,291
Black taggers. bxs., 45
Tin ingots, 50
Tin slabs, 1164
Lead, pigs, 730

The imports of Metals, Cutlery and Hardware for the week ending November 21 were as follows:

	Quantity.	Value.
Anvils	177	$1,030
Brass goods	40	4,356
Bismuth	7	2,459
Bronzes	43	6,800
Chains and anchors	12	549
Clocks	65	10,290
Copper	....	101
Cutlery	107	31,111
Gas fixtures	1	116
Guns	116	17, 03
Hardware	2	58
Iron, pig, tons	4,900	68,078
Iron, sheet, tons	39	2,949
Iron ore, tons	1,175	3,096
Iron, cotton ties	4,400	3,334
Iron, other, tons	1,582	64,222
Lead, pigs	478	1,287
Machinery	217	11,845
Metal goods	279	28,444
Nails	563	1,115
Needles	20	7,052
Nickel	5	1,217
Old metal	....	15
Percussion caps	17	3,193
Pins	1	79
Plated ware	3	281
Plumbago	140	862
Quicksilver	100	2,537
Regulus, antimony	117	6,691
Saddlery	14	1,788
Steel	106,473	106,189
Tin, boxes	45,324	197,389
Tin, slabs, 10,484 lbs.	1,040,240	178,060
Wire	197	24,097
Zinc	154,330	8,831
Zinc oxide	101	923

The following is a comparison with previous dates:

	For the week.	47 weeks of 1884.	Same time 1883.
Cutlery, pkgs	107	4,812	6,686
Hardware, pkgs	2	649	1,059
Iron, R. R., bars	....	9,422	143,345
Lead, pigs	478	37,201	12,124
Steel, pkgs	106,473	1,659,172	2,537,243
Tin, bxs	45,324	1,767,570	1,956,591
Tin slabs, lbs	1,040,240	23,237,760	22,907,857

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	℔	$.08 @	....
" light	"	.07 @	....
Copper Bottoms	"	.07 @	....
Yellow Metal	"	.06 @	....
Brass, heavy	"	.06 @	....
" light	"	.05 @	....
Composition, heavy	"	.08 @	....
Lead, heavy	"	.02½ @	....
Tea Lead	"	.02½ @	.02¾
Zinc	"	.02½ @	.02¾
Pewter, No. 1	"	.19 @	....
" No. 2	"	.08 @	....
Wrought Iron	℔ ton.	16.00 @	....
Light "	"	10.00 @	....
Stove Plate Iron	"	10.00 @	....
Machinery "	"	12.00 @	12.50
Grate Bars	"	4.00 @	....
Stereotype Plates	℔	.04 @	....
Electrotype "	"	.03¼ @	....
Small Type	"	.05 @	.05½

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	℔	3½@	4 ¢
" Cotton	"	3½ @	... ¢
" No. 2	"	2½ @	2¾¢
White No. 1	"	4 @	4¼¢
" No. 2	"	2 @	2¼¢
Seconds	"	½ @	1 ¢
Soft Woolens	"	4 @	4½¢
Mixed Rags	"	1½ @	1¾¢
Gunny Bagging	"	1¼ @	1½¢
Jute Butts	"	1½ @	1¾¢
Kentucky Bagging	"	2¼ @	2½¢
Book Stock	"	1½ @	1¾¢
Newspapers	"	1 @	...¢
Waste Paper and Scraps	"	½ @	...
Kentucky Bale Rope	"	3½ @	4 ¢

Foreign Markets.

FRANCE.

PARIS, November 10, 1884.—*Metals.*—The Metal market, with the exception of Copper, has been rather irrregular and weak; we quote *Copper*, Chili Bars, 136.25 @ 141.25 francs ℔ 100 kg.; Ingots and Slabs, 142.50; Best Selected, 147.50, and Pure Corocoro Ore, 140; *Tin*, Banca, 207.50; Billiton and Straits, 202.50; Australian, 203.50, and English, 197.50; *Lead*, 26 @ 27, and *Spelter*, 38.25 @ 39. *Iron.*—The crisis in the Iron trade in France does not yet abate; Merchant in this city sells at 15 francs ℔ 100 kg., and Flooring at 14.50. Old Rails remain steady at 7.50 francs, Iron, and 7., Steel. Charcoal Iron, 24; Sheets, 20 @ 25, and Wire Nails, No. 18, in bulk, 27. The market at Valenciennes is heavy, at 13 @ 13.50, Merchant, No 2, and Thick Sheets, No. 2, at 17 francs. From Saint Dizier they report that there would be wholesale stoppage of work should Coke Merchant decline in that market to 15, and Mixed to 16 @ 17. There was still some work in the foundries, Special Iron for machine shops and Railroad Material being neglected, together with the rest. The only thing still tolerably brisk there is Hollow-ware, at 12 francs. Goods for the winter season are in light request. Heavy Castings are so low in price that they cannot well decline any further. Some few large works at the North at the low figures ruling have received some large Railroad-Material orders which they are now engaged in filling. Advices from the Ardennes are still flat; but few rolling mills are fully occupied. In the Haute-Marne makers prefer not to sell rather than subscribe to ruling ruinous rates; wages will have to be reduced. At St. Etienne, in Central France, the state of affairs is worse than ever. *Coal* is moderately active and steady.—*Moniteur des Intérêts Matériels.*

BELGIUM.

BRUSSELS, November 10, 1884.—*Iron.*—Not much of a change is noticeable in the Belgian Iron market: a sort of hand-to-mouth business is being carried on, orders being light, yet, in the aggregate, sufficing to keep works tolerably busy. Some larger orders for rolling stock will in a few days be adjudicated upon; it should be mentioned that those car shops which were set up as branch concerns in the North of France have made least money. Belgian Steel works have received orders enough to last them for some time to come, and their prospects for an export trade are also encouraging. Thus Australia will come forward with important Rail orders, which the Anglo-Germano-Belgian syndicate will take charge of. Meanwhile 10,000 tons for the Roman railways the Bochum and Phœnix Steel Works assumed to furnish. Prices meanwhile have been steady; we quote English and Luxembourg Foundry Pig, $5.30; Charleroi, $6.75; Puddling, $4 @ $5; Merchant Nos. 1 to 3, $11.25 @ $12.75; Beams, $12 @ $12.50; Corners, $12.50 @ $13.50; Sheets Nos. 2 to 4, $18.50 @ $25.50; Commercial do., $21.50; Thin, $23.50. As matters stand in Belgium, prospects for the new year are decidedly reassuring; the winter will be bridged over without difficulty, as we have shown, and for spring, so far as we are able to judge at this early stage, the outlook is promising, there being no disturbing element discernible, except perhaps dear money. Crops have been fine, and the purchasing capability of the people at large is good; Iron is now so low that consumers have every inducement to anticipate requirements. *Coal* has been moderately active at steady prices. —*Moniteur Industriel.*

GERMANY.

HAMBURG, November 10, 1884.—*Iron.*—Accounts from Upper Silesia remain satisfactory, there being a brisk demand for Finished, while stocks are running low, and this demand is pretty much altogether domestic, which is an encouraging sign. Wire also sells more readily than before, the same moving off so well that in a month or two we may have to record a decided advance in price. In Rhenish Westphalia, too, there is an improved outlook, stocks gradually decreasing. The rolling mills have received orders sufficient to carry them into the new year. Rolled Wire is, however, neglected, and forms an exception, while Sheets sell with tolerable steadiness. Railroad material has been engaged at the works for months ahead. Dortmund quotes ℔ ton: Prime Spiegel, 50 @ 52 marks; White Pig, No. 1, 47 @ 49; No. 2, 42 @ 45; Thomas, 42 @ 43; Siegen-Nassau, 46 @ 47.50; Luxembourg, 34 @ 36; German Foundry, Nos. 1-3, 52 @ 61; Mudela, 70 @ 72; English, No. 3, 55 @ 55.50; do. Bessemer at port of shipment, 43 @ 44; Spanish do., 52 @ 53; German Bessemer, 50 @ 52; Merchant, 111 @ 135; Sheets, 150 @ 165, and Rolled Wire, 117 @ 120. *Petroleum.*—Wirth & Co., Frankfort-on-the-Main, November 1, report that light filtered Cylinder Oils of about 60° flashing point remain steady, while dark winter Machine Oils have risen slightly in value; light-colored greasy, .90 5-7, are sustained; white and bloomless natural Oils are in excessive supply. In Russia such Oils are now prepared for burning purposes, are cheap and possess great illuminating power. *Metals.*—Lead has been dull in this market at 11.75 @ 12, German, ℔ 100 ℔; Copper inactive at 55 marks, Lake; Tin lifeless at 84 @ 87, and Spelter flat at 14.90 @ 15.25, spot and to arrive. —*Borsenhalle.*

HOLLAND.

ROTTERDAM, November 8, 1884.—*Tin*—Quite a business has been transacted during the week, and Billiton has advanced 25 centimes, but Banca remains inactive. We quote: Banca, spot, 46.75; from the next sale, 46.50; Billiton, spot, 45.25, and March delivery, 45.50. There has been a good demand at Amsterdam at 46 for Banca, spot, and 44.02½ Billiton do.; Dec. do., 44.75; Jan., 44.75, and March, 45; at 25 centimes more Tin is freely offered. At the close 45 was paid for Billiton, spot, and March cannot be had for less than 45.75, while Banca is nominally held at 46.50.—*Koch & Vlierboom.*

AUSTRIA.

VIENNA, November 8, 1884.—*Iron.*—The critical condition of the Austro-Hungarian Iron industry continues; locomotive-makers have been compelled to discharge hands, the crisis in the sugar branch is at its hight, and the low price at which our crops are forced off also causes a feeling of depression. Makers of Steel Rails have commenced to turn out Beams and other Structural Iron instead, and this again causes a glut in Beams. Meanwhile owners of blast furnaces do their best to maintain current rates, but, as Pig is evidently held too high, the wisdom of this policy may well be doubted, the more so as, instead of curtailing production, they are engaged in extending it. The only undertaking that is to bring some work is the tramway extension in this city, dating from January next. Iron is dull, but steady; Pig, ℔ ton, 50 @ 58 florins; Merchant, 115 @ 134; Sheets, 170 @ 190, and Beams, 130 @ 135. *Metals* have been dull; we quote Copper, ℔ 100 kg., 70 @ 84; Tin, 102 @ 108; Lead, 16 @ 18.50; Spelter, 18 @ 19.50, and Antimony, 52.—*Austrian Trade Journal.*

EAST INDIES.

PENANG, October 4, 1884.—*Tin.*—After departure of the mail of 20th ultimo, the market opened at $24.82½ and rose to $24.95, but soon after unfavorable cable news from Europe, combined with a slack Chinese demand, caused a decline to $24.20, at which figure the market closes nominally, without buyers. Receipts have been unusually large—some 15,000 piculs, mostly Tongkah; Europeans bought 7000 piculs, and natives 4000. Exchange, four months' bank, 3/8⅞.—*Schmidt, Kustermann & Co.*

SINGAPORE, October 9, 1884.—*Tin.*—Tin has been sold at $23.80, and buyers now offer $23.65. The decline which originated in London has taken the trade here by surprise, as neither shipments nor receipts have exceeded the estimates, and any reaction would cause a sharp advance, dealers having yet to cover the bulk of their recent sales. Shipments this month will be large, as there is plenty of tonnage available. For New York the Edward Kidder is well engaged for weight; for Boston the Donbighshire is loading. *Exchange* is quoted 3/9⅛ for six months' sight credit drafts on London. Shipments from the Straits settlements to the United States have been during the first nine months 46,225 piculs, against 25,215 in 1883; 88,444 in 1882; 68,186 in 1881; 10,764 in 1880, and 78,176 in 1879. On the 1st inst. the Lennox took for New York 422 piculs, and the Rohilla, 1741.—*Gilfillan, Wood & Co.*

BATAVIA, September 29, 1884.—*Metals.*—The trade still disappoints expectations, and a very quiet tone pervades the market, stocks of most articles being very large and retailers generally well provided. With Swedish Iron the market is well supplied, and no sales have been made. English Iron.—The trade has not yet recovered from the effect of the auction sales some time ago; there is not the slightest demand for any kind of Iron. Fair sales have been made of English Copper Sheathing in assorted numbers, at 62.50 guilders, but at present there are no buyers for either English or Dutch, though holders are willing to sell at low prices. Wire Nails have fallen to 9.50; nothing doing in other classes of Metals. *Petroleum.*—There arrived from New York during the fortnight three cargoes, bringing, altogether, 82,300 cases. The market is flat and fully supplied. *Coal.*—Seven cargoes of Cardiff and Newcastle arrived during the fortnight, with, altogether, 7104 tons. The demand is light. *Exchange*, six months' sight private drafts on London are selling at 11.90.—*Reiss & Co.*

NEW PUBLICATIONS.

MANUFACTURE OF BRICKS, TILES AND TERRA-COTTA. By Charles Thomas Davis. Size, 9¼x6 inches, 472 pages. Published by Henry Carey Baird & Co. Price, $5.

The manufacture of bricks, tiles and terra-cotta, as well as a consideration of the modern methods and appliances by which they are produced, have, as Mr. Davis observes, never heretofore been practically treated in any work. Such being the case, the difficulties attendent upon the task that Mr. Davis has attempted will be readily appreciated. While the art of brick-making dates from the most remote antiquity, and is consequently a widely known, if not necessarily well-understood, subject, there has within a comparatively recent period been a great revival in tile and terra-cotta manufacture, due to the largely-increased demand for these materials for ornamental building purposes. The book is divided into nine chapters. Beginning with the history of bricks, the author follows with a description of the different varieties of clay, their characteristics, qualities and the localities where they are found, after which are some general remarks on bricks, enameling bricks and tiles, glazing earthenware, &c. The two next chapters are on the manufacture of bricks by hand and by machinery, followed by Chapter VI on fire-clays, fire-bricks, their preparation and manufacture. The remainder of the book treats of terra-cotta and tiles. Historical sketches are given of terra-cotta and tiles, together with their use and method of manufacture, the final chapter being devoted to ornamental tiles. Apart from the general merit of the work as the above *resumé* of its contents would indicate, the book is published in a very tasteful and serviceable manner, the subject treated of being illustrated by 228 engravings and 6 plates, besides being well and fully indexed. To the manufacturer or other person commercially interested in bricks the book will be of much interest, while the general reader will derive both pleasure and profit from its perusal.

Closing of Collieries in Yorkshire, England.—The returns issued by the Government inspector of mines for Yorkshire show that since 1874 no fewer than 155 collieries have been abandoned in Yorkshire, many of which caused considerable loss to the owners. In the six years between 1870 and 1876 there was an increase of 146 collieries in the county, the number in the latter year being 562. The low prices of coal which followed the period of prosperity seems to have played sad havoc with collieries working the thin seam, while some of the larger concerns have had to be worked at a loss. In the past nine or ten years no fewer than 52 collieries have been abandoned in the Leeds district, 19 of these having been closed during the past three years. A careful analysis of the reports show that nine collieries were abandoned in 1874, 15 in 1875, 22 in 1876, 30 in 1877, 21 in 1878, 10 in 1879, 13 in 1880–81, 14 in 1882 and 13 last year. In 1870 the quantity raised was only 10,606,604 tons, whereas 10 years later it had increased to 17,468,536 tons. In the previous 10 years, between 1860 and 1870, the progress made was very slight. In the former year 387 collieries in Yorkshire produced 9,284,000, while 416 collieries in 1870 raised 1,322,604 tons more coal.

Cobalt Extraction.—According to a process patented by Messrs. Herrenschmidt and Constable, of Sydney, the ore is crushed and the percentage of oxides of cobalt ascertained; then sufficient sulphate of iron is added to convert the oxides into sulphates, and water added till it is the consistency of thick slime. Then it is boiled for an hour, when the whole of the oxides will have been converted into sulphates and held in solution by the liquor. The thick residue is then washed, so as to remove every trace of sulphates, which may then be treated with any of the well-known materials for reconverting sulphates into oxides.

If mercury in a glass, says an exchange, is covered over with water slightly acidulated, into which is plunged an aluminium wire, and if the mercury and the wire are connected with the negative pole of a battery of two Daniells, while a platinum plate immersed in the water is connected with the positive pole, the surfaces of the wire and of the mercury are deoxidized by the hydrogen gas evolved. If the wire is then plunged down into the mercury it becomes moistened, which did not take place previously, and is amalgamated. On exposure to the air the surface becomes dull, flocks of alumina appear and separate from the wire. Iron may be amalgamated in the same manner, and in time the mercury rises up along the immersed wire.

A Berlin correspondent of the *St. James's Gazette* writes that an engineer named Fisher is reported to have made an important discovery in aeronautics, by which he is enabled to condense or expand the gas in a balloon. The agent he employs is compressed carbonic acid, with the help of which he can ascend or descend at pleasure. This perpendicular movement puts it in the power of the aeronaut to go up or down until he finds a current of air moving in the horizontal direction he wishes. Military critics attribute great importance to this discovery, because in time of war a balloon will be able to reach the enemy's territory, and ascend again, without requiring a fresh supply of gas.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., November 25, 1884.

The investigation of the assessment of duties on tinned plates at Philadelphia and New York has been assigned to Special Agents Hines and Adams, of the Treasury Department. A statement submitted to the Secretary of the Treasury by the American manufacturers of sheet iron, presenting their side of the question, has been forwarded to the special agents in order to give them the benefit of the views of those gentlemen. The question, as it is understood from the manufacturers, is that that class of the article named which is shipped in boxes is tinned plate, and that the thicker article in larger sheets is sheet iron. The agents are expected to make an early report, when the question of construction of the tariff law relating to the duty on this article will receive action at the hands of the Secretary of the Treasury.

THE ORDNANCE COMMISSION.

Representative Crisp, who is a member of the Randall Committee on Ordnance, has arrived here, and says that the investigations of the commission have been very thorough and will be embodied in an exhaustive report to be submitted early after the meeting of Congress. Their visits to the steel works of Philadelphia, Pittsburgh, Harrisburg and other points have been both satisfactory and instructive. Mr. Randall, the chairman, is expected here on Thursday.

FINISHING A BIG GUN.

It was reported at the Ordnance Bureau of the Navy Department to-day that the 10-inch jacket had been completed and would be put on the steel tube within a day or two. This is the largest gun of this character yet attempted in this country. The work has been done at the Washington Navy Yard, and has been successful in every particular.

PROTECTION IN GERMANY.

The consul of the United States at Dusseldorf, Germany, has transmitted to the Department of State some interesting statistics showing the effect of the new German tariff of 1879 on labor, as illustrated in 320 iron works, foundries and machine shops. The period covered is from 1879 to 1883, and includes 102 companies. The amount of capital stock was 356,293,340 marks (23.8 cents to a mark) in 1883, and 369,754,763 in 1879. In 1883 the gross profit was 25,281,905 marks, and total loss 1,087,627 marks, or a net profit of 6.79 per cent. In 1879 the net profit of the same companies was 1.60 per cent. or a net excess of profits of 5.19 per cent. in 1883, as against 5.19 per cent. in 1879. Consul Warner, by way of comment, adds: "These figures show conclusively that protection in Germany is doing a great deal toward reviving the industries of the country and elevating the condition of the laboring classes. Certainly, the great chancellor, who has, by his most wonderful faculty of foreseeing future events, achieved so much good for the welfare of his country and its people, would not be urging the adoption of a strong protective tariff if he had any doubt that it would fail to be beneficial to the country."

ANOTHER EFFECT OF THE PROTECTIVE TARIFF OF GERMANY.

The consul at Aix la Chapelle mentions another instance of the beneficial effects of the new protective system of Germany. The hat industry, which 10 years ago was depressed by the force of English competition in woolen hat manufacture, has not only driven the English article out of the country, but has built up quite a foreign trade. The official statistics show that, while in 1875 494,000 English wool hats were imported, in 1883 England furnished but 39,000.

PATENT LAW OF SWEDEN AND NORWAY.

On January 1, 1885, the new Patent law of Sweden and Norway will take effect. Under this law only inventors, Swedish or foreign, or the legal representatives of inventors, are entitled to obtain a patent on inventions of industrial productions or on special methods of manufacture of such productions. An invention is not considered new in case it has, prior to the filing of the application for patent, been described in any published journal or worked. The publication of an invention in print by foreign patent authorities or exhibition in any international exhibition is no obstacle if an application be filed within six months thereafter. A foreign applicant must appear by power of attorney to an agent residing in the country. All patents are granted for 15 years, and patents previous to 1885 may be prolonged 15 years from date of the expiration of the patent. The fee is 50 crowns—about $50. Should the application be rejected, half that sum will be returned. Upon each patent granted, with exception for supplementary patents, the patentee is required to pay to the patent authorities an annual fee amounting for each patent year the second, third, fourth and fifth 25 crowns a year, for each of the following five years 50 crowns a year, and for each of the remaining five years 75 crowns a year. Failure to pay within 90 days after the beginning of the new patent year works forfeiture. The law is in 27 sections and provides the details for its administration.

A GENERAL TARIFF ORGANIZATION.

At a recent meeting of the Eastern Pig Iron Association, a resolution was passed appointing a committee of five "to consider the subject of a general organization representing the different industries of the United States in the interest of protection." The president of the association, Henry S. Eckert, of Reading, Pa., appointed as members of that committee, Messrs. W. A. Ingham, president of the Rockhill Iron and Coal Company; F. A. Comly, treasurer Andover Iron Company; Geo. T. Barnes, treasurer Crane Iron Company; W. J. Taylor, Chester, N. J., and James E. Thropp, Edge Hill Furnace, Pa. A meeting of the committee will be held in Philadelphia next week, when it is expected that a plan of organization for submission to the representative industries of the United States will be prepared.

The Position of Tin.

Since our editorial, in the latter part of October, on the decline in tin, the market has gradually recovered, chiefly, it is asserted, because of the prospect of a speedy settlement of the Franco-Chinese trouble and of a resumption of the demand for tin for China in the Straits' Settlements. It now appears, however, that this settlement is again indefinitely postponed. Hence the argument that tin ought to return to about the figure of October 4, when it stood at £78, and whence it broke to £72. 10/ on October 15, loses much of its force. The fact is that tin is weak, in common with other metals and raw material generally, because the consumptive demand fails to keep pace with the liberal output, trade everywhere being dull, and disturbed in some quarters by dear money, and in others by heavy failures. Thus, on November 5, a great Batavia-Amsterdam failure of a leading and old firm caused a decline in a day in the value of Netherland-India commercial bank shares from 122 to 78 per cent., and in colonial bank shares from 90 to 57 per cent. in Amsterdam—a panic about as bad as ours of May 14. That such profound disturbances in the financial affairs of Holland with her Indian Empire, although arising from coffee and sugar, cannot well operate in favor of maintaining the value of tin above what it should command seems evident. Tin is so interwoven with the trade of Holland and Batavia that its position cannot be strengthened by similar occurrences.

While what we have stated was taking place in Holland and Java, Messrs. W. T. Sargant & Sons wrote from London, under date of November 6:

Market continued to decline from £78, which was the rate on October 4, until £72. 10/ was accepted on 15th of same month. Then the market improved rapidly, with very little business, and eventually a very large business was done between £76 and £77. After that the market again eased off, gradually declining to £73. 10/, from which point there has been a slight recovery, to-day's closing rate being £74. 10/, buyers. Considerable sales were made by dealers here to New York at very low prices, the result being to swell the deliveries from this side at the same time that it replenished stocks of American dealers at low rates, an operation which has affected the market very unfavorably. Regarding statistics we have to note that the European deliveries show an increase for the 10 months of 1233 tons over last year, and the shipments of Straits and Australian together a decrease of 419 tons, according to some accounts, and 769 tons according to others. It now remains to be seen what will be the effect of the enormous fall in value that has taken place since the end of February, 1882. We then had a stock in London of 7170 tons, and a total visible supply of 15,635 tons, with a price of £111 per ton; now the stock in London is reduced to 3998 tons, and the total visible supply is 14,267 tons, while the price is £74. 10/ per ton. In view of such a position are we to go on falling lower and lower, or will there be a revival of enterprise? If previous experience were a safe guide, we should say yes, but all we can say at present is that there are no signs visible of a feeling toward enterprise.

Simultaneously the statistics on the other side stood for the month of October as follows:

Shipments.

	1884. Tons.	1883. Tons.	1882. Tons.
Straits to England	1,750	1,370	1,350
To this country	620	225	540
Total	2,370	1,595	1,890
Australian to England	1,200	1,050	950
To this country	....	....	50
Total	3,570	2,645	2,890

Deliveries.

In England	2,620	1,250	1,257
In Holland	820	870	678
Total	3,440	2,120	1,935
Reshipped this way	950	70	....

And in New York and Boston as under:

American Tin Movement in October.

	Tons.
October 1, stock	1,400
" to 31, arrivals	1,180
Total	2,580
October 1 to 31, consumption	800
Total	1,780

Afloat from the Straits.

August steamers	tons,	100
September "	"	250
October "	"	550— 900
Total		2,680
November 2, afloat from Europe		500
Visible supply		3,180
Against visible supply 1883		3,500

From January 1 to October 31 the shipments to Europe and America from the Straits and Australia had been:

	Tons.		Tons.
1884	21,620	1882	18,072
1883	22,039	1881	16,628

In other words, the supply had been nearly as liberal as last year, while trade was a great deal duller; even without the stoppage in the shipments from the Straits to China it would have been difficult to sustain prices.

The report from Singapore about this time read as follows: "The decline which originated in London has taken the trade here by surprise, as neither shipments nor receipts have exceeded the estimates, and any reaction would cause a sharp advance, dealers having yet to cover the bulk of their recent sales. Shipments this month will, however, be large, as there is plenty of tonnage available." These very large shipments from the Straits of course helped to precipitate the decline, coinciding as they did, and as the above statistics for October show, with unusually free shipments from Australia, where the shipping of the new-clip wool requires tin for better stowage.

We cannot, indeed, gather anything reassuring from the statistics we have given, and, although tin has for the moment partially recovered from the great break in October, we do not see that the main causes which led to the depreciation have disappeared. Nor is the state of the London money market such as to induce speculation for a rise in this metal. The season is equally adverse to it. Unless inducements in point of cheapness of an article are very great, neither the trade nor consumers care to increase their holdings so close upon a new year. On the contrary, most of them will prefer to wait for the new year and see how the outlook may be then.

The announcement has just been made of a very important transaction in the pig-iron trade. The Thomas Iron Company have made arrangements to transfer to their control the property of the Saucon Iron Company, at Hellertown, Northampton County, Pa., consisting of two blast furnaces, an ore railroad, railroad cars, ore mines and leases, &c. The terms are agreed upon, but there are some complications which will require a sheriff's sale for their settlement. That will be held upon the 1st of December, after which the transfer will be made. The Saucon furnaces have not been in blast for eight months. The Thomas Iron Company at present own nine furnaces, of which six are in blast. Including the Saucon furnaces, they will own 11. Mr. B. G. Clarke, of this city, the agent of the company, says that the furnaces just purchased will be overhauled and put in complete order, so that they can be started whenever the condition of the iron trade warrants it. The ore mines of the Saucon Iron Company are not the least desirable part of this acquisition. They alone form a valuable property. By this purchase the Thomas Iron Company add considerably to their prominence among the producers of Pig Iron. They will have an annual capacity of 150,000 to 160,000 tons of Pig Iron, far exceeding that of any other works in the country devoted exclusively to this branch of the Iron trade.

TRADE PUBLICATIONS.

Selma, Ala.

A committee of the citizens of Selma, Ala., have issued a pamphlet for the purpose of presenting concise and reliable information concerning the city of Selma and the surrounding country. The city, which is situated on the northern bank of the Alabama River, is adjacent to rich iron and coal deposits and surrounded by fine timber and agricultural lands. Its population at present is over 10,000, having increased 25 per cent. during the last three years. Possessing many facilities for manufacturing purposes, it is rapidly increasing in importance as a manufacturing center. Besides cotton mills, which have been in successful operation for the last few years, Selma possesses various other factions and mills. The pamphlet contains very full information concerning the present condition of Selma, which would prove of value to any interested in the growing industries of the South.

Electric Lighting.

The rapid growth of the business of the companies engaged in electric lighting, and the general progress which has been made in the art as indicated by the patents which have been taken out, and the improvements which have been made in the appliances for lighting, are subjects for general remark. The literature of electric lighting has developed, perhaps, with just as great rapidity as the art itself. The number of volumes that have been issued is phenomenal, while the catalogues put out by the different companies and which explain in detail the different systems evince an enterprise in this direction that is scarcely paralleled in any other line of business. An example in point is a small quarto pamphlet recently issued by the United States Electric Lighting Company, whose New York office is at 59 and 61 Liberty street. In paper and typography this book compares favorably with some of the finest publications to be found in the regular book trade, while the illustrations displayed have been done in the highest style of the engraver's art. Each page is embellished by a red-line border, and, altogether, the book is one of the most attractive trade publications which it has been our fortune to examine. It would be impossible in a notice of this kind to describe the contents of the work satisfactorily, for nothing short of a presentation of its entire subject matter would be adequate. The Weston incandescent system is the principal subject discussed. The various appliances used in lighting by this system, including illustrations of lamps full size, are prominent features. The method of wiring buildings, including brackets for use in office and factories, are also carefully shown. The arc lighting produced by this company is also illustrated, although not so fully as the incandescent system.

The Patent Office Surplus.

There are some statements in the report of the commissioner of patents for the late fiscal year, says the New York *Times*, that demand the careful attention of Congress and of all who take an interest in the development of inventive genius. The receipts of the Patent Office in that year were $1,145,433, and the expenditures were $901,413, leaving a surplus of $244,020. The Patent Office is not supported by general taxation. Its maintenance is not a burden which the people bear. The receipts are paid in by inventors, and the money contributed by them in the form of fees, &c., is more than sufficient for the expenses of the office. There has been a surplus every year—only eight years excepted—since 1837. The report of the commissioner for the calendar year ending December 31, 1883, showed that in that year the surplus had been $471,005, or 41 per cent. of the receipts. That report also showed that the average annual surplus for the five years ending December 31, 1883, had been $285,992. It was not intended that the Patent Office should be a source of revenue for use in other directions. It was to be made self-sustaining by the fees required from inventors. But it appears that the inventors of the United States, very many of whom are not overloaded with money, pay not only the expenses of the office, but from 25 to 40 per cent. in addition to those expenses, piling up a surplus that has attracted the attention of liberal-minded legislators, some of whom have proposed that it should form part of a fund to be used in educating the illiterate in the South, without showing any good reason why patentees should be taxed for that purpose.

Now, if the Patent Office were so well equipped that applicants could not reasonably complain of delays, the inventors might fairly ask for a reduction of fees. But it is well known that its forces are not sufficient for the work that ought to be done every year. For example, the report published a few days ago says that there were on June 30, 1884, awaiting action in the office no less than 9186 applications, or 5087 more than were awaiting action on the corresponding date in 1883. The arguments in the telephone interference cases closed in November, 1881, but the decision was not reached until July, 1883, and was not confirmed, on appeal, until two or three months ago. Surely, if inventors pay so much more than is required for expenses, they have a right to ask that their applications shall be promptly passed upon. That the force employed is too small, and that the salaries paid are so low that many examiners resign as soon as they have become qualified by their experience to serve as patent attorneys, has been shown again and again by commissioners. Because there is a large surplus it does not follow that there should be a general reduction of fees, but it does follow that inventors should be given the worth of their money, and not be forced to submit to delays that sometimes very seriously affect the value of their inventions. It may be that more than one Government bureau can be found in which the number of clerks might be reduced without doing any harm, but in the Patent Office the number of employees should be increased, and it is folly for Congress to disregard the requests of the commissioner and the arguments suggested by the annual surplus and by the figures which show an accumulation of untouched applications.

Condensation of Sulphuric-Acid Gas.

In the *Berg und Huettenmännische Zeitung*, No. 42, 1884, there is a description, with illustrations, of a somewhat complicated and elaborate apparatus in use at Rosdzin, in Silesia, and patented by the owners of the works. The sulphurous gases from the calcining furnaces are taken to a lead-lined tower packed with coke, flints or any other suitable material in the usual manner, down which water trickles from a cistern on top of the tower; the water absorbs the sulphurous-acid gas and also the sulphuric acid and soluble sulphates which may be carried over from the calciners. It then flows out of the bottom of the tower, and is taken through a lead pipe to a series of closed shallow lead pans, a dozen in number, arranged one above the other in a fire-brick chamber, through which pass the hot gases from the calciners on their way to the condensing tower. The lead pans communicate with each other by lead pipes placed in diagonally opposite corners, and arranged so that the liquor is taken out from the top of each pan and flows into the bottom of the pan below it. The hot gases passing around and between the pans cause the liquor to leave the lowest pan at considerable heat. This hot liquor then rises through another lead pipe to the top of a smaller tower, of cylindrical shape, and lined with lead, in the center of which revolves a shaft covered with lead and having several disks of lead attached to it. These disks, revolving on the shaft, alternate with fixed ledges or shelves on the sides of the tower, and as the liquor flows down in a cascade over these ledges and disks it is broken up into very fine spray. At the same time a current of hot air is passing up the tower, and takes up and carries away the sulphurous-acid gas which is liberated from the hot spray. It is drawn off from the top of the tower and led away to the sulphuric-acid chambers, or other point at which it may be desired to further operate with the sulphurous acid. The hot liquors which have been freed from the sulphurous acid taken up in the condensation tower flow into a long closed cistern of lead, through which pass a large number of lead tubes arranged like a surface condenser. The air which is to pass into the spray tower is first forced through these tubes, which are surrounded by the hot liquor, and is in this way warmed. The apparatus is so made that the pipes expose sufficient surface to completely cool down the liquor, which then leaves the cistern and is pumped up to the top of the condensation tower, to again absorb sulphurous acid, &c., and perform the same round. The warm air from the lead tubes is taken through heaters, which are exposed to the hot gases coming from the calciners, and, being thus made quite hot, passes into the spray tower as described. By continually circulating in this manner the liquor finally takes up a considerable amount of sulphuric acid and soluble sulphates, and when sufficiently concentrated a portion is drawn off and is evaporated down in lead pans, a corresponding quantity of fresh water being added in the condensation tower.

The Cliff & Righter Company, Limited, of Oswego, N. Y., have procured a patent for a new form of elliptic wagon spring. The leaves are formed of steel bars of uniform thickness throughout their length, the ends being beveled in the usual manner to impart a neat finish. The central portion of each bar is maintained intact, so as to form flat, central longitudinal top and bottom surfaces by which the leaves lie contiguous one against the other. These flat surfaces, although comparatively narrow, afford sufficient bearings to prevent the leaves from tilting laterally. The side portions of the leaves taper from the central flat portion to the edges to form water sheds between the leaves. By the exclusion of water from the contiguous surfaces the leaves, it is said, are to a great extent protected from corrosion, and are thus rendered more durable.

J. H. & F. L. Coes, of Worcester, Mass., have brought out a new wrench that is made without screw-threads in the jaw casting. The movable jaw is provided near its bottom with a recess, into which is fitted a nut. The metal below and above this recess is bored out to admit the rosette screw, which passes also through the screw-threaded bore of the nut. When the rosette screw is turned in, the lip on the movable jaw beneath the recess will draw the jaw down, while when the screw is turned out the nut is forced against the shoulder at the top of the recess and moves the jaw up. The advantage claimed is that it makes a very strong and serviceable wrench, with no liability of the jaw becoming worn and slipping on the threads of the screw.

Trade Report.

General Hardware.

There is evidence of a slightly improved tone in the market, some houses reporting that there is an increased business doing, more orders being received, though in nearly all cases they are for small quantities. Some of the houses, however, do not speak as cheerfully of the condition of the market, failing to find in their business any improvement as yet. The export trade at present is fairly satisfactory, and we hear of increased activity. There is little to be announced with reference to prices, it not being the season when manufacturers usually revise their lists or discounts, but the same general conditions which have characterized the market for some time still continue. Manufacturers and merchants are accepting the prospect of quiet trade for a month or two, and manufacturers are continuing to limit the production of goods by discharging hands or working on short time. A fair number of travelers are on the road and report the trade indisposed to order, except as goods are required to meet the present demands of their customers. A review of the market in special lines is given below, and the trade will notice the advance which is reported in one or two lines. While the advance of prices by the formation of pools or similar combinations cannot be regarded as an index of a generally improved condition of trade, or as resulting from any increased demand, still, in a market which is characterized by a prevailing weakness, they will be noted with satisfaction as exceptions to the general course of prices.

NAILS.

Quite a cheerful tone is noted in the local Nail market this week, orders having been received in good quantity, while some of them have been of considerable size. The export trade continues exceedingly fair, and, so far as this branch of the business is concerned, there are no complaints to make. The prospective labor trouble in New England is, of course, not in a condition to have any effect upon the market, as the reduction in wages does not take place until December 1. In the meantime we understand that another New England Nail factory has shut down on account of the unprofitableness of business. This is one of the mills that has been manufacturing quite largely for the export trade. The competition among other mills for export orders is undoubtedly what has brought about this cessation of operations. The outlook in the Nail trade has not changed from the position of the past three or four weeks, being still very unsatisfactory from the manufacturers' standpoint. Inquiries are in the market from speculators, who are watching very closely, in the hope that they will be able to pick up lots as soon as they touch figures that have apparently been fixed upon as indicating the bottom. Prices are no better than they have been, nor do we understand that they are any worse. New York City stores are still obtaining $2.10 to $2.15 for ordinary lots, and from $2 up for quantity, but the lower rate has not yet become a ruling quotation, being rather exceptional. Lots are being offered from dock at prices under these quotations, but very irregularly, and not in such quantity as to seriously affect the general market.

BARB WIRE.

Trade seems to be looking up a little, as we hear of orders having been placed to some extent during the past week. A little better feeling is also reported from some parts of the West. Large dealers are not yet in the market, and there will be comparatively little activity in the trade until they make their appearance. A fair demand is expected from the South, persons who have traveled in that section reporting the feeling there as one of very great confidence, and an influx of orders is expected from that locality some time during the next 60 days. The trade locally shows no special change in prices, quotations continuing nominally about as they have been reported for several weeks past, namely, 4¼ cents for Painted and 5¼ cents for Galvanized Four-Point, with concessions on large lots.

CORDAGE.

The following revised list of Cordage has been issued by the manufacturers, under date of November 19, and is subject to the usual discount of 1 cent per pound to the trade. It will be seen that a reduction of 1 cent per pound has been made in the price of Manila Rope, the price having been broken on account of the forcing on the market of a quantity of Hemp. The price is still weak and the expectation is expressed that there may be a further decline:

	Cts. per lb.
Manila Rope.	
1¼ inch cir. and upward	14½
12 thread, or ⅝ inch diameter	15
6 and 9 thread, or ½ and 5-16 inch diameter	15½
Hay Rope, 2, 3, 4 or 5 thread	14½
Bolt and Point Rope	16
Tarred Rope and Lath Yarn	14
Stave, Leather and Hop Twine	15
Sisal Rope.	
1¼ inch cir. and upward	9½
12 thread, or ⅝ inch diameter	10
6 and 9 thread, or ½ and 5-16 inch diameter	10½
Hay Rope, 2, 3, 4 or 5 thread	9½
Tarred Rope and Lath Yarn	9
Russia Hemp.	
White Rope	17
Tarred Rope and Ratline	11
Spun Yarn	10½
Bolt Rope	18
Marline, Houseline, Rounding and Hambroline	15
Packing	16
American Hemp.	
White Rope	18
Tarred Rope and Ratline	12½
Spun Yarn	12
Lath Yarn	12½
Packing	17
Marline, Houseline, Rounding and Hambroline	16
Sash and Bell Cord	25 to 35
Italian Hemp.	
Packing	20
Tarred Rope	16
Jute.	
Rope and Packing	8
Oakum.	
Best Oakum	7¼
U. S. Navy	6¾
Navy	6¼

Discount to Dealers.—On 100 bales and over, ½ cent per pound.

PLANES.

The association of Plane manufacturers have advanced their price to the retail trade and quote as follows: First quality Bench, discount 20; second quality Bench, discount 25; Fancy Planes, discount 15, with an additional 2 per cent. for cash. The price to the jobbing trade has also been somewhat advanced and measures are in contemplation to prevent the retail prices as published above from being undersold by the jobbing houses.

A HINT TO MANUFACTURERS.

The following communication directs attention to a defect which is found in nearly all new issues of catalogues by manufacturers, and we take pleasure in laying it before them. If they will act upon the suggestion which is made by our esteemed correspondents, they will be promoting the convenience of the trade, and at the same time serving their own interests:

LOUISVILLE, November 19, 1884.

To the Editor of the Iron Age: As the season approaches for new catalogues, corrected lists, revised discounts, &c., attention may be profitably called to the incompleteness of the formula which usually accompanies such publications, viz., "Please note changes." This is often pasted on the outside of a catalogue of 100 pages or more. There is nothing for the conscientious buyer but to pore over every page and wade through each list, and compare them with their predecessors. This ought to be unnecessary, and may be rendered so by a little consideration. It is seldom that the changes are general, or that they apply to more than a moderate number of lists or discounts. Let such be mentioned, in any abbreviated way deemed desirable, in the announcement itself. We would suggest it to those manufacturers who expect to issue any publications the coming season, and believe that the trade at large would appreciate such a labor-saving change.

W. B. BELKNAP & Co.

CATALOGUES AND PRICES.

Woodrough & McParlin, Cincinnati, Ohio, for whom W. H. Quinn & Co. are Eastern agents, 99 Chambers street, New York, have issued a catalogue showing the line of Saws of which they are the manufacturers. They request their customers to examine the list carefully, as various alterations and additions have been made. It covers the well-known line of goods of which they are the manufacturers, and is accompained by a discount sheet, from which we take the following prices of some of the leading goods:

	Discount per cent.
Circular Saws to 46 inches	50
" " over 46 inches	55
Band Saws	20
Regular Cross-cut Saws (except Diamond and One-man Cross-cut Saws)	40
Diamond Cross-cut Saws	50
One man " "	40
Hand Saws	35
Hack "	25
Compass and Pad Saws	25
Pruning and Back "	25
Brick and Plastering Trowels	25
Billet Webs	25
Framed Wood Saws	25
Slaw and Kraut Cutters	40
Bevels and Try Squares	60

The price of the Combination Post and Hop Bar, made by the Cronk Hanger Company, for whom John F. Lovejoy is agent, 102 Chambers street, New York, and of which we gave a description in last week's *Iron Age*, is $2.50 each, or $30 per dozen.

The price list for the coming season of the Steel Goods made by the Huntley & Babcock Agricultural Company, Utica, N. Y., for whom W. H. Quinn & Co. are agents, 99 Chambers street, in this city, is at hand. It covers a line of Hay, Straw, Manure and Spading Forks, Socket, Solid Shank and Riveted Hoes, Axes, Steel Garden Rakes, Potato Hooks, Hop Hooks, Corn Cutters, &c.

The Bindley Hardware Company, Pittsburgh, Pa., have sent out a catalogue illustrating the Ice Skates, Skate Straps, &c., made by the Union Hardware Company, Torrington, Conn., and also a circular of Sleigh Bells for the present season.

Sash Locks made by the Payson Manufacturing Company, Chicago, may be quoted at discount 50 and 10 and 5 per cent., and their Casters at discount 60 per cent.

AN INQUIRY.

The following communication has been received from a Hardware house, with the request that we lay it before our readers for their suggestions. We take pleasure in so doing, thinking that some in the trade may be disposed to comply with the request which is made in it:

To the Editor of the Iron Age: One of the meanest, dirtiest jobs a Hardwareman has to do is to draw oil from a barrel, and that often in a dark cellar. Perhaps some of the readers of your paper have some better plan than the ordinary way, and will confer a favor upon many Hardwaremen by giving their way of doing it. SUBSCRIBER.

BUSINESS ITEMS.

The Buffalo Hammer Company, Buffalo, N. Y., announce that, having purchased the business of H. W. Kip, they will continue the manufacture of Solid Cast Steel Hammers as per their list, adding that they will endeavor to merit the confidence and orders of the trade, which will have their personal inspection and attention. They will brand their Hammers as they have heretofore been made, "H. W. Kip." They have added new machinery and increased their capacity for the production of these goods, for the sale of which the services of Samuel A. Haines, 88 Chambers street, have been secured.

Donald Mackay has issued a circular to the trade, informing them that he has resumed his connection with the Morris Sash Lock Manufacturing Company, of Cincinnati, whom he represented for many years, and directs attention to the line of fine Bronze Hardware, including the Morris Sash Lock, which he is thus enabled to offer them.

The striking advertisement on page 33, in which Amidon & White, Buffalo, N. Y., illustrate their Corner Brace and celebrate its merits in rhyme, will be perused with interest by our readers.

Skates, both Ice and Roller, are in active demand, orders for the Ice Skates being stimulated by the colder weather which now prevails. In this connection the advertisement on page 18, in which Dame, Stoddard & Kendall, Boston, Mass., call attention to Forbes' Patent Acme Club Skate, will be of interest to our readers.

Woodruff, Miller & Co., Mt. Carmel, Conn., report that they are doing an active trade in their "Mt. Carmel" Steel Toe-Calk Ox Shoes, which they speak of as selling freely on account of their quality and low price.

The Globe Manufacturing Company, 926 Walnut street, Philadelphia, Pa., to some of whose patented specialties we have directed the attention of the trade, have been energetically pushing forward the production of these goods, but have been delayed longer than they anticipated, so that they have not been ready to deliver some of them. They report that they are now over nearly all of the tedious experiments incident to the starting of a new enterprise, and hope in a very short time to have their manufacturing facilities in such shape as to meet all demands.

One of our exchanges contains a description of the Hardware establishment of C. H. Call & Co., Marquette, Mich., which indicates the extent of the business done by this enterprising house. They are engaged principally in Heavy Hardware, and it would appear that a good portion of their trade is with the mining companies in the vicinity.

To the notice which appeared in our last issue of Timothy B. Hussey's catalogue, North Berwick, Me., we may add that the Steel Colter Harrow, patented March 6, 1883, is the newest implement which he is putting on the market, and which is spoken of as having had an excellent sale from the good work it does and its durability and cheapness. His Centennial Horse Hoe is, we believe, but little known outside of New England. This implement is Mr. Hussey's own invention, and has had, he informs us, a constantly extending sale.

CARRIAGE HARDWARE.

The manufacturers of Wrought-Iron goods for carriage-builders have formed an association for the purpose of securing uniform prices on the leading articles of their manufacture. Preliminary meetings for the accomplishment of this end were held October 25 and November 6, but the permanent organization was effected at a meeting held in Meriden, Conn., on the 19th and 20th inst. The reason for this action is that for some time prices in this line have been badly demoralized, owing to the fact that the 18 or 20 manufacturers have been selling their goods from different lists and at different discounts, which, with the competition that has existed, which in some cases has been very animated, and with the general prevailing dullness in trade and depreciation in values, has made business in this branch very unsatisfactory. It is said that even the manufacturers longest established, and who are in possession of every facility for the production of goods, have been doing an unremunerative business for nearly two years, so that with decreased sales and an undue effort on the part of some manufacturers to sell, coupled with the rivalry to which we have above referred, prices on many leading articles were reduced to from 5 to 15 per cent. below the cost of production. To improve this condition of things and to remedy existing evils, an association has been formed under the name of

THE NATIONAL ASSOCIATION OF CARRIAGE HARDWARE MANUFACTURERS.

It is composed of the leading manufacturers of Forged Carriage Irons only, and does not cover malleable, brass and plated goods. Of this association E. D. Clapp, of Auburn, N. Y., is president; J. P. Howe, of Birmingham, Conn., vice-president, and F. L. Cowles, New Haven, Conn., secretary and treasurer. The Executive Committee is composed of the following members: J. P. Howe, of Wilcox & Howe, Birmingham, Conn.; F. L. Cowles, of C. Cowles & Co, New Haven, Conn.; J. M. Foote, of H. M. Strieby & Co., Newark, N. J., and Chas. E. Hill, of the Sperry Manufacturing Company, Ansonia, Conn. The prices on some goods have been slightly advanced, and others have been advanced materially, in order to bring the prices from below cost to figures at which they will yield a fair profit. The intent of the manufacturers has been to secure fairly remunerative prices, and to avoid the mistake made by some combinations, by whom prices have been fixed so high as to invite competition and even the starting of new establishments. It is thought that at the prices as at present established it would be impossible for new concerns to enter on the manufacture of this line of goods with any prospect of success. It is stated that the concerns which have started within the past few years admit that they have made no money, and that even some of the established firms have during this period been doing a losing business. The manufacturers do not regard this line of trade as being overdone, from the fact that machinery for the manufacture of Carriage Iron Forgings cannot be run automatically, like Tack and Pin machines, but requires high-priced machinists to make dies and experienced workmen in the forging shop. It is not necessary for us to publish the details of the arrangement which has been made by the association, the combination, however, being similar in its main features to that recently formed by the Norway Bolt manufacturers. In addition to the action taken with reference to prices, it was further decided that no freight is to be allowed except for foreign export orders, it being stated that the comparatively low figures which have been adopted will not permit a deduction in the form of freight allowance on the goods. No extra discounts are allowed for foreign export nor for Canada trade, but the prices which have been established are understood to apply to orders of all purchasers, whether domestic or foreign. The following manufacturers are members of the association:

THE E. D. CLAPP MANUFACTURING COMPANY, Auburn, N. Y.

WILCOX & HOWE, Birmingham, Conn.

C. COWLES & Co., New Haven, Conn.

THE UPSON NUT COMPANY, Unionville, Conn.

THE COLUMBUS BOLT WORKS, Columbus, Ohio.

H. M. STRIEBY & Co., Newark, N. J.

THE SPERRY MANUFACTURING COMPANY, Ansonia, Conn.

H. D. SMITH & Co., Plantsville, Conn.

THE ATWATER MANUFACTURING COMPANY, Plantsville, Conn.

BLAKESLEE & Co., Plantsville, Conn.

J. B SAVAGE, Southington, Conn.

THE BEECHER MANUFACTURING COMPANY, Meriden, Conn.

E. N. BALDWIN, Birmingham, Conn.

D. H GOWING, Syracuse, N Y.

C. W. SCUDDER & Co., St. Johnsville, N.Y.

THE QUEEN CITY FORGING COMPANY, Cincinnati, Ohio.

THE CHICAGO FORGING COMPANY, Chicago, Ill.

J. WILCOX'S SONS, Port Chester, N. Y.

MCGUIRE BROS., Alliance, Ohio.

M. SEWARD & SON, New Haven, Conn.

R. & N. ECCLES, Auburn, N. Y.

UNION COACH AND CARRIAGE HARDWARE COMPANY, Union, N. Y.

Trade in this line is reported to be neither materially better nor worse than it has been since June. Most, if not all, the manufacturers have been running short time for the past two or three months, and few, if any, are running more than half time now. The formation of this association is, however, said to have induced a somewhat better feeling, and one of the prominent manufacturers advises us that the prospects seem good for a fair business next mouth, and for a good business in January, the stock, both in dealers and carriage-makers' hands, being known to be light.

The following letter from a well-known house in this line, explaining the action of the manufacturers and the reasons which have led to it, will be of interest to our readers, and may add some information to that given above:

The manufacturers of Carriage Hardware Forgings have formed an association with the object of adjusting and regulating prices, not advancing, except where they have been forced down to cost or below, as in several cases of excessive competition. Our aim is to maintain steady and uniform prices at a point that will permit good goods to be made, and yet low enough to stimulate free consumption. All the principal parties East and West are in the combination, except two, and these are associated so far as the making and maintaining prices and terms are concerned. This has been rendered necessary by the lack hitherto of any concerted action in our trade and the resulting wide differences in price on the same article, and the liability of serious misunderstanding on the part of each as to what was being done by the others. We find that our movement meets the general approval of the mercantile trade who handle our goods, and who know that certain inequalities existed in prices, and found the uncertainty in that respect from day to day a great drawback to business. Stocks in our line are light, and everything seems to point to a good winter trade, particularly in the better grades of forgings—notwithstanding the dullness in other lines—and at fair prices for cheap times.

Metal Market.

Copper.—Hardly anything has transpired during the week in Lake Superior Copper, which goes on selling at 12¾¢ @ 13¢, but a good many contracts are said to have been made for export of other brands. We quote "Anchor" brand 12½¢, and other brands 11½¢ @ 12¼¢. The sales of Lake Superior Copper recently made in Europe are supposed to have been fixed at the time at 12⅛¢. The London market meanwhile seems quite demoralized, Chili Bars being down this morning to £51, the lowest price ever reached that we know of there. The visible supply of Copper in England and France November 1 was 41,760 tons, against 46,833 in 1883, and the price of Bars £52. 15/, against £61. 5/ November 1, 1883, and £69. 5/ November 1, 1882. Manufactures may be nominally quoted as under: Bottoms, 19¢; Braziers, 19¢; Sheathing, 17¢, and Bolt Copper, 19¢. We receive from London the ensuing cablegram this afternoon: "Market weaker. Best Selected, £57. 10/ @ £58. 10/, and Chili Bars, £51. 15/ @ £52. 5/."

Tin.—London being quite steady, £75. spot, Straits, and £75. 7/6, three months, the market here has fluctuated very little since our last report, Straits being in moderate demand at 16¾¢, large lines, and 17¢ in a jobbing way. We receive from London the following this afternoon: "Tin is a little firmer. Straits Ingot, spot, £75 @ £75. 10/, and futures, £75. 5/ @ £76." *Tin Plates.*—There has been a steady, quiet market, Liverpool meanwhile coming a shade better. We quote here at the close, large lines, ordinary brands, ₱ box: Charcoal Bright, $5 @ $5.25; do. Ternes, $4.60 @ $4.75; Coke Tin, $4.62½ @ $4.70, and do. Ternes, $4.37½ @ $4.50. Liverpool cables Coke Tin 14/3 @ 14/6, and Charcoal, 16/ @ 18/. From London we are told that the market is steadier.

Lead.—Nothing but a few carloads of Common Domestic sold at $3.40; round lots are offering at $3.35 without takers, and the best bids made to-day are 3¼¢, partly, we understand, speculative. St. Louis wires that Lead is unsaleable there at $3.15¢. London has been steady the past few days at £10. 15/, spot, Spanish. Manufactures are quoted as follows: Lead Pipe, 5¾¢ ₱ lb; Sheet Lead, 6¾¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York 3¢ ₱ lb. Shot: Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ ₱ lb extra. From London we are cabled this afternoon that the market is quiet.

Spelter and Zinc.—The spell of dullness in the market for Common Domestic Spelter has not been broken during the week, a small business being transacted at $4.35 @ $4.40, while Silesian is nominally held at 4⅞¢. Bertha Refined remains unaltered, 8¢. *Sheet Zinc.*—The market has remained active at $5.25 @ $5.30. From London we learn that the market is unchanged.

Antimony—Remains moderately active and steady at 10¼¢ for Hallett and 10½¢ @ 10¾¢ for Cookson.

Metal Exchange.

We are reported the following transactions as having occurred on the floor of the Exchange since our last issue:

THURSDAY, November 20.

500 boxes Tin Plates,	Jan	$4.52½
500 " " "	Jan	4.52½
500 " " "	Feb	4.52½

MONDAY, November 24.

100 tons Pig Iron Certificates (No. 2), Feb....$17.50

SCIENTIFIC AND TECHNICAL.

Experimental Mine Explosions.

A recent number of *Nature* contains an interesting account, by Mr. W. Galloway, of some experiments carried out by the Prussian Fire-damp Commission, at Neunkirchen, Germany, with a view of ascertaining the influence which coal-dust has, alone and in conjunction with fire-damp, in propagating explosions in mines. The experiments are made in a horizontal wooden gallery 167 feet long, closed at one end, and having a horizontal branch gallery 33 feet long, standing out at right angles to it at a distance of 93 feet from its closed end. Both the main gallery and the branch consist of elliptical rings of double T-iron, lined internally with planks 1.6 inches thick, which abut closely together and are grooved and feather-jointed lengthwise. The greater axis of the ellipse stands vertically, and is about 5 feet 7 inches long; the lesser axis is 3 feet 11 inches long. The main and branch galleries are both embedded in the pit-heap to such a depth that the rubbish is level with their top on one side and reaches to three-quarters of their hight on the other side. Along the exposed part of the latter side there is a row of windows, 32 in the main gallery and three in the branch gallery, situated somewhat more than 1 yard apart. They are formed of sheets of glass about ⅔ inch thick set in cast-iron frames. There are also a number of openings in the top of the main gallery, one of which, near the closed end, is an ordinary manhole, which can be closed by a manhole door like that of a boiler, and serves as a means of ingress and egress. The others are circular, about 9 inches in diameter, and are lightly closed with wooden plugs attached to chains, which act as safety-valves. All these openings assist in the removal of after-damp after an explosion.

The closed end of the main gallery is sunk about 3 feet 9 inches into a block of masonry whose dimensions are 12 feet 4 inches long, 9 feet 9 inches wide and 13 feet high. Seven cast-iron cannon, with a bore similar to that of a shot-hole in hard ground, are built into the block so that their mouths are flush with the face. There are two holes near the top, two near the bottom and three in the middle, grouped symmetrically in relation to the two axes of the ellipse. The middle hole is 37 inches deep by 1.57 inches in diameter; the others are 31½ inches deep by 1.37 inches in diameter. The axes of the two upper and of the two lower holes are placed in such a position that they form the edges of a four-sided regular prism whose apex is situated in the axis of the main gallery at a distance of 16.4 feet from the face. The axes of the three middle holes constitute a bundle of rays which meet at the same point as the last. Wooden hoops projecting inward from the sides are placed at various distances apart in the main gallery within the first 65½ feet from the face. By fastening cloth diaphragms to these hoops, compartments of various capacity can be formed, that of the first next the face being 705 cubic feet.

The shots are fired electrically. The charge, which consists of 230 grams, 0

about ½ pound, of powder, occupies a length of 8.64 inches in the central hole, leaving room for rather over 28 inches of stemming, and 11 inches in the other holes, leaving about 20 inches for stemming. The coal-dust is strewn upon the floor of the gallery from the face toward the open end in a layer of about 1.17 inches thick immediately before firing the shots. The weight of dust in each 10 yards of length is about 30 pounds. It has been found in practice that, notwithstanding the upward direction of their axes, the shots next the floor produce the greatest disturbance of the coal-dust and give rise to longer coal-dust flames than any of the others. In all the experiments witnessed by Mr. Calloway one shot-hole only, namely, one of the two next the floor, was charged and fired. The charge consisted of 230 grams of blasting powder each time, and the tamping was damp clay. Both ends of the branch gallery were closed with a double board brattice 1.96 inches thick.

In the first experiment neither coal-dust nor fire-damp was employed, and the flame of the shot was seen through the windows to be a little over 13 feet long. In the second experiment a length of 65 feet of the floor of the main gallery was strewn with coal-dust from Camphausen Colliery, in the Saarbrücken mining district. The shot gave rise to a loud detonation, and the resulting flame filled the gallery to a distance of 88½ feet. When the thick black after-damp had been drawn off by means of two of Korting's exhausters, placed over two of the safety-holes and worked with compressed air, it was found that the inner brattice of the branch gallery had been broken, and small globules of coke were observed lying on the surface of the remaining coal-dust. In the third experiment a length of 130 feet of the main gallery was strewn with coal dust from Pluto Mine, in Westphalia. When the shot was fired, the flame traversed the whole length of the gallery with great velocity, and came out at the open end to a distance of 16 feet, being thus altogether 183 feet long. Notwithstanding the entire absence of fire-damp, this was a true explosion of the most violent kind, and the clouds of after-damp which streamed from every opening darkened the air in the neighborhood of the gallery for two or three minutes. The brattice at the inner end of the branch gallery had not been replaced before this experiment, and the one at its outer end was broken into small fragments, some of which were thrown to a distance of 115 feet. The flame was also seen to emerge from the branch gallery to a distance of several yards. The coal-dust remaining on the floor after the explosion was covered with a sooty film, in which coke globules were found embedded.

The brattice at each end of the branch gallery was now replaced, and the floor of the main gallery swept clean as usual. In the fourth and last experiment, coal-dust from Pluto Mine was strewn on the floor for a distance of 65 feet from the face. A diaphragm of prepared canvas was fastened in the gallery at the point where the space inclosed between itself and the face amounts to 705 cubic feet. A volume of 35¼ cubic feet of fire damp was introduced into this space, and complete diffusion was effected by beating the air with cloths. The mixture of fire-damp and air thus obtained is not inflammable or explosive by itself, and shows a cap of only $1\frac{5}{6}$ inches high on the reduced flame of a safety-lamp. The firing of the shot produced a flame 190 feet long, accompanied by a report like a thunder-clap. The inner brattice of the branch gallery was broken and drawn several yards into the main gallery, but the outer one remained intact.

Some idea of the great force of the two last explosions may be gathered from the following facts: An ordinary mine railway, beginning on a level with the floor of the main gallery, extends away from its open end in the direction of its length, and ascending at an angle of 4°. An ordinary mine wagon, loaded with iron so as to weigh altogether 15½ cwt., was standing on the rails at the mouth of the main gallery when the shots were fired. When the third shot was fired it was driven up along the rails to a distance of 23 feet, and when the fourth shot was fired it was literally hurled along the railway by the force of the explosion to a distance of 52½ feet, being driven off the rails and running on the ground for the last 6 feet. The boards constituting the end of this wagon next the gallery were broken, but not torn off. A small beam 4 inches square, bolted across the rails at the mouth of the gallery, so as to form a stop for the wagon, was torn from the bolts which held it, and sent flying after the train. Lastly, a shower of stones and *débris* was raised by the blast which swept out of the mouth of the gallery, and some of the pieces were carried upward of 100 feet.

The Future of Water-Gas.

In *Stahl und Eisen*, V. Ehrenwerth, writing of the relative merits of water-gas and ordinary producer gas, comes to the conclusion that for all the principal metallurgical uses there is at present no prospect of the water gas being introduced and superseding the other. The reasons given are that the plant for production of water-gas is considerably more costly than ordinary producers, and that the gas from the latter already allows of the production of temperatures sufficient for the requirements, and as high as our furnace materials can stand with advantage. Nevertheless, he considers that water-gas has a great future in some special industries, because it enables us to obtain high temperatures without previous heating of the gas and air, and these high temperatures can also be obtained with a flame less liable to cause oxidation. The gas is in use at Essen for welding with great advantage. For domestic firing, the only great advantage of water-gas over ordinary producer gas would be the much smaller mains that could be used for conveying it. But taking this into count, and comparing the relative costs of water-gas and ordinary illuminating gas as now provided for domestic use, the conclusion is that water-gas is rightly called the "fuel of the future." But it must be rendered strong-smelling, so that danger of poisoning and explosions from undetected leakages may be less than would be the case with an almost odorless gas.

Partnership.

Questions affection the partnership relation in a country like ours, where business interests are so extensive and complicated, are frequent and important. The rights and liabilities of partners between themselves, and as to third persons, present a great many points of difficulty, and merchants are often troubled in the course of their dealings as to precisely what their legal rights and and obligations are. It is proposed in this article to discuss in detail the ordinary questions, likely to occur in general business.

The first point that suggests itself is the question, What is a parnership? when are two or more persons partners? It must be premised that persons may be partners as to third persons who are not partners as between themselves. The test of partnership *inter se* would seem to be an agreement to share both profits and losses. (Walden *vs.* Sherburne, 15 Johnson, 409.) A joint ownership of the partnership funds is also essential. (Heimstreet *vs.* Howland, 5 Denio, 68.) This question arises only between the parties themselves when one of them seeks to have some control of the business, and the other claims that no partnership was actually formed. Of course, when there is an explicit contract, and the individual names appear in the firm name, there is no likelihood of this point being raised.

But when a concern has failed, and the several members of the firm are all insolvent, an attempt is often made by creditors to charge persons whose names were not on the sign, and who were not partners *inter se*, with liability for the debts of the partnership. The class of persons thus sought to be held are confidential clerks, managers, general agents having charge of branch houses, and any other employees who may receive a share in the profits as part of their compensation. Are these persons liable as partners? We think not. It is said in support of this attempt that by taking part of the profits they diminish the fund from which the creditors are paid, and therefore the creditors should have some recourse to them. But it seems clear that this is only a method of ascertaining their salary, and that they should no more be held liable than a clerk who receives a fixed amount. As long as such a person is not entitled to control the business, or liable for the loss, it is settled now that he is not a partner as to creditors (Vanderburgh *vs.* Hull, 20 Wedell, 70; Osbrey *vs.* Reimer, 51 New York, 630.)

In one case where a man was employed to purchase grain, and was to receive for his services one-half the profits realized on the grain he should purchase, he was held by the court not to be a partner. (Lewis *vs.* Greider, 51 New York, 231.)

But where two mercantile firms agreed to share the profit and loss upon contracts for the purchase and sale of merchandise, to be made by each firm in its own name, the members of both firms are all liable as partners to creditors, although clearly not partners as between themselves. (Smith *vs.* Wright, 4 Abbott's Decisions, 274.)

It is customary on the formation of a partnership for the parties to draw up articles prescribing the terms of the contract in detail; how much each partner shall put into the concern, what share of the profits he shall draw out, the duration of the relation, and the rights and duties of the several members. These articles, though very desirable in order to avoid misunderstanding, are, of course, not essential. But where they are signed by the partners, the latter are bound by their provisions, and cannot claim to have made some other verbal agreement changing or modifying them in whole or in part. Yet these articles, though binding on the partners themselves, have no effect on persons dealing with the firm unless they are shown to such persons.

By the custom of business, each partner is supposed to have a right to bind his firm in various ways, and every one is justified in believing he has such a right, whether the articles give it to him or forbid it. The firm is bound just the same. (Bank of Rochester *vs.* Monteath, 1 Denio, 402.)

For instance, if the contract provides that the junior partner shall have no power to issue promissory notes in the name of the firm, he may, nevertheless, make such a note, and the firm is liable if the other party took the note in good faith and paid value for it. Many of these articles contain a clause to the effect that "profits are to be shared equally" Sometimes this has been put in by a lawyer's clerk, who copies it from a book of forms. Now, suppose that members had put in unequal amounts of capital, and the one advancing the largest sum supposed that he was to receive a share of the profits in proportion to his advance, the other party, nevertheless, is entitled to rest on the written contract signed by both, and claim half the profits. It is true that if it can be proved that the insertion of such a clause was a mutual mistake, and both parties understood differently, the clause may be changed so as to correspond with the intention. But this is almost impossible to prove if the other partner claims, as he is likely to do, that such was not the arrangement at all. This rule works both ways. If there is a clause providing that "the losses are to be shared equally," both parties are equally liable without regard to the amount of capital each contributed. (Jones *vs.* Butler, 87 New York, 613.)

THE RIGHTS OF PARTNERS AS TO EACH OTHER.

Each partner is expected to give a reasonable amount of his time and attention to the business of the firm, and the other partners may, in case of his neglect or refusal to do so, ask for a dissolution, and then reorganize without him. But if they go on with the business and conduct and manage it themselves without such a formal dissolution, they cannot claim, on the accounting, to deduct from his share of the capital and profits any commissions or compensation for any extra work they have done in attending to the affairs of the firm. (Caldwell *vs.* Leiber, 7 Paige, 483; Lyon *vs.* Snyder, 61 Barb., 172.)

The relation of partners to third persons is that of agency, but they are trustees as between themselves. Everything they do, therefore, within the general scope of their business must inure to the benefit of the firm, on the ground that no trustee can use his trust position to get any advantage for himself. This is well illustrated by the famous case of Mitchell *vs.* Reed, in the New York Court of Appeals, a few years ago. The parties, it seems, were joint lessees of the Hoffman House, a valuable property in the City of New York. A short time previous to the expiration of their very lucrative lease, it was agreed between them that their partnership should be dissolved when that event happened. One of them, however, the defendant in the action, went to the proprietor, unknown to his partner, and secured a new lease for himself alone. His former partner claimed that this was a breach of the duties of the partnership trust, and sued for an equal share of the profits under the new lease, and he was held to be entitled to it.

If some of the members of a firm, without the knowledge of their co-partners, particularly if it be in violation of the artitles, engage in other business in the firm name and on the firm credit, the other partners have a legal claim for a *pro rata* share of the profits of this separate business. It makes no difference that they know nothing of it until the dissolution of the firm. (Herrick *vs.* Ames, 8 Bosworth, 115; Moritz *vs.* Peebles, 4 E. D. Smith, 135.) Nor can one partner enter into a secret agreement with a third person, by means of which he may be enabled to reap an advantage or profit out of the transactions of such person with the firm. He is obliged to account to the firm for all the profit so made. (Manufacturers' Bank *vs.* Cox, 2 Hunx's Reports, 572.)

The cases go very far in support of the proposition that every transaction of a partner must be considered as made for the benefit of the partnership. Thus, in the case of Leonard *vs.* Martin, 52 Barbour's Reports, 113, one of the partners of a concern engaged in the lumber business put in as part of his share of the capital a tract of land which he had purchased at a trifling sum on a tax sale. He was not permitted to be credited in the accounts with its full value.

As is well known, the partnership assets are liable to pay the partnership debts in full before any of the individual creditors of a particular partner can make a claim. In the same way a partner's private and personal property is first liable to pay his individual creditors in full before any of the firm creditors can seize it. But a partner can transfer his interest in the partnership property as by mortgage to secure or pay his individual debt as long as the firm is solvent. He cannot, however, divest the title of the firm as to any specific portion of such property by transferring it in satisfaction of a private debt. (Walsh *vs.* Kelly, 42 Barbour, 98.) The assignee of the partner in the first case would only be entitled to whatever was owing to such partner after a settlement of the partnership accounts. (Rodriguez *vs.* Heffernan, 5 Johns Ch., 417.)

THE AUTHORITY OF PARTNERS TO BIND THE FIRM.

As has been previously observed, each partner has the right to bind his copartners by any contract within the scope of the firm business. And this notwithstanding express agreement to the contrary between the partners, or the other's dissent. (Wilkins *vs.* Pearce, 5 Denio, 541.)

But it must always be remembered that the contract must be within the scope of the common enterprise. A member of a firm formed for agricultural purposes has no power to bind his copartners by the issuing of commercial paper. (Hunt *vs.* Chapin, 6 Lansing, 139.) Nor can a partner make a conveyance or mortgage of land belonging to the firm, or execute any other instrument under seal so as to bind his partners, except a release of a debt. (McBride *vs.* Hagan, 1 Wendell, 326.)

A deed of composition is substantially a release. The reason why this exception is made would seem to be that a partner having the power to contract debts without the concurrence of the other members should also have the power to compromise or release them. He would certainly have power to make an oral arrangement, but the law requires a sealed instrument in order to make such a transaction valid. There is plainly no consideration, but the presence of a seal implies one and makes the contract good (Beach *vs.* Ollendorf, 1 Hilton, 41.)

This does not prevent a partner from binding the firm by a sealed instrument executed by himself alone, with the assent of the other partners. (Pettio *vs.* Bloomer, 21 Howard's Practice Reports, 317.) One partner may also assign a debt due to the firm. (Everit *vs.* Strong, 5 Hill, 163.)

It is well settled that a partner has no implied authority to submit a partnership matter to arbitration without his copartner's consent. (Harrington *vs.* Higham, 13 Barbour, 660.) Nor has he the power to admit the service of legal papers, such as a summons or complaint upon his copartner (Tripp *vs.* Vincent, 8 Paige, 176), nor to confess a judgment so as to bind all the members of the firm. (Burney *vs.* Le Gal, 19 Barbour, 592.)

While it is a general custom for partners to sign notes, bills and checks in the firm name, this must be confined to paper so issued in connection with the ordinary business of the firm. A private creditor who receives a note in payment of a private debt of a partner, signed by him in the firm name, is bound to make inquiries as to the authority of that partner to bind his firm in that way. A person selling goods to the firm, however, in the regular course of trade, need take no such precautions. He is justified in relying on the implied authority.

To sign the note of another as surety or accommodation indorser in the firm name is not within the scope of the business. To make the note valid as against the firm, the other partners must have knowledge of it and must give their consent. Otherwise only the individual partner can be held by the holder of the note. (Foot *vs.* Sabin, 19 Johnston, 154; Bank of Vergennes *vs.* Cameron, 7 Barb., 143.)

A single member, moreover, has full power to assign all the partnership property without the knowledge of his copartner in order to pay a *bona fide* debt of the firm. (Egberts *vs.* Hood, 3 Paige, 517.) He may also mortgage the partnership property to its full value, if need be, to secure such an indebtedness. (Willett *vs.* Stringer, 17 Abbott's Practice, 152.)

This does not mean that he can go so far as to make a general assignment for the benefit of creditors without the knowledge or consent of copartners. Much less can he make a preferential assignment. We do not think that even a majority of the members of the firm could do so without the assent of all the others. But if one of them should abscond it has been held that the remaining partners can make such an assignment. The same would be true if one still a partner in name had relinquished all control and management in the business He need not join in the assignment, and it will be valid without his signature or consent. (Haggerty *vs.* Granger, 15 Howard's Practice Reports, 243; Palmer *vs.* Myers, 43 Barbour, 509; Kemp *vs.* Carnley, 3 Duer, 1).

A partner, moreover, has the power to borrow money in the name of the firm. He may never turn in the money to the partnership funds, yet the firm is responsible. The party loaning the partner is not obliged to get the express assent of the rest of the firm. He is safe without it, as he has the right to rest on the implied authority. Wittaker *vs.* Brown, 16 Wendell, 505. A partner, however, who is a trustee and holds considerable property in that capacity, does not make the firm liable if he applies it to the use of the firm without the knowledge of his copartners. So it has been held in the case of Jaques *vs.* Marquand, 6 Cowen, 497.

The reason why the firm is not liable in the latter case, while it would be to a third person making a loan, is this: that no one is deceived by any tacit representations of authority. The trustee who so uses the trust money has a right to place it where he pleases, while a lender supposing the firm is the borrower would be deceived. It would very hard to make a firm liable for a breach of trust of one of their number in an entirely distinct matter.

(To be continued.)

The Rock Island Arsenal.

On a beautiful island in the Mississippi River, between the cities of Rock Island and Moline on the Illinois side and Davenport on the Iowa side, the Government is preparing shops and storehouses which shall make it the largest and principal arsenal in the country Rock Island, on which the arsenal is situated, was acquired by the United States through a treaty made at St. Louis in 1804 with certain of the chiefs of the Sac and Fox Indians. In 1816 United States troops were sent there to build a fort. The first Fort Armstrong on the island was completed in 1817, but had little of interest connected with it till the Black Hawk war in 1831, when it was the center of that struggle which ended the hostilities with the Sacs and Foxes. A garrison was maintained there till 1836, when it was evacuated and the island left in charge of an Indian agent till 1840. For five years it was an ordnance depot, but in 1845 the stores were removed to St. Louis. From this time till 1862, when the act for establishing the arsenal was passed, the island was in charge of a civil agent of the War Department.

As early as 1841 Congress passed an act for the examination of the West in order to select a suitable place for a national arsenal. Rock Island was reported as a favorable position, and aided by the efforts of the citizens of the three cities, Davenport, Rock Island and Moline, in whose midst the island lies, Congress was persuaded to pass an act in 1862 to appropriate $100,000 to build an arsenal on the island. Soon after the building had been begun Gen. Thomas Rodman, the inventor of the famous gun, was placed in command of the works. His plan, which was approved in 1866, comprehended 10 great shops in two rows of five shops each, those on the north for the armory, those on the south for the arsenal. General Rodman lived to see two of the shops completed, besides a handsome house for the commanding officer. In 1871 Col. D. W. Flagler was placed in command, and to his untiring energy, his complete understanding of the necessities of the work before him, and his devotion to the whole thing, is due the wonderful condition of the arsenal at present. He had General Rodman's plans, to be sure, but he was, and still is, for that matter, continually hampered by too small appropriations from Congress, so that nothing but his wonderful management could have brought the works so near completion. He has supplemented the progress of construction by the manufacture of stores for the army to the extent of $125,000 annually, proving that ordnance stores can be manufactured there and distributed to the army cheaper than in any other way.

Of the 10 great shops planted by General Rodman eight are entirely finished, and the last two well under way. Each building is built entirely of stone from a neighboring quarry, and cousists of two parallel wings 60 by 300 feet, 9 feet apart, which gives a total area to each shop of a little more than an acre. The center shop in the armory row is the rolling and forging mill, while the two on either side are for the manufacture of small arms, and woodwork for the larger places. The central shop of the arsenal row is the foundry; the other four are for the manufacture of leather, wood, and all sorts of materials of war. Thus they are ready to make all arms, equipments for all troops, gun carriage, harness, tools, &c. Everything except powder can be made here, and probably that will soon have its manufactory as well. When complete l and running to its full capacity some 25,000 men can be employed, so it will be seen that it is infinitely larger and more important than any other existing arsenal in the country. At present the shops are being run with very few hands, and only enough work for immediate use is being turned out, but on the shortest notice the shops would be turning out equipment for 500,000 men while the arsenals in the East were merely unloading their present stores. The power of all this work is supplied by the river as well as steam. The dam and waterworks serving the city of Moline, as well as the island, was the joint work of Colonel Flagler and the manufacturers in that city, the city owning one-quarter and being allowed to hire in time of peace as much of the 400-horse-power as the United States is using Aside from the shops themselves, Colonel Flagler's work is very extensive, as seen from the officers' quarters, the soldiers' barracks, post buildings, the system of servers, the Moline bridge, roads and avenues all over the island, water-power wall, pump-house, transmission of water-power, the ornamentation and care of the island, as well as the manufacture of all shop fixtures and machinery.

Colonel Flager has made this island of 970 acres into a veritable park by his taste and care. No one is admitted without a pass, nor is any one allowed to make it a thoroughfare, it being naturally the shortest way from Davenport to Moline—one is, therefore, obliged to come out by the same gate by which one entered. Beautiful avenues and woodland roads cover the whole island, making it the most beautiful drive in the county. The immense trees are all taken care of and named, the grass is kept beautifully, the great number of birds are all fostered and looked after, so that the whole place has the air of a beautiful English park, and whoever rides through it cannot but be proud that his country owns anything so beautiful. At the same time he is surprised that the United States ever had the idea of making anything so attractive until he remembers that it is all due to Colonel Flager's forethought, taste and energy. By no means the least important part of the works are the three bridges by which the island is connected with the main land—two to the Illinois side, one to the Iowa. The largest of these is the one from the northwest corner of the island, crossing the main channel of the Mississippi over to Davenport. It is 1550 feet long; consists of five spans and a draw; cost about $1,000,000, of which the United States paid one-half and the Chicago, Rock Island and Pacific Railroad the other, and is altogether one of the finest bridges in the country. The bridge has two decks, so to speak, the upper for the railroad, the lower for the railroad and footwalk, and travel over it is free except in the cars. The 5-cent fare charged by the railroad to every passenger goes two-fifths to the United States and three-fifths to the railroad, who keep the bridge in repair. The traffic on this bridge, connecting as it does Davenport and Rock Island, is very heavy. A bridge of some 600 feet in length connects the southwest corner of the island with the city of Rock Island, and 2½ miles up the river another bridge of 700 feet leads from the southeastern end to the city of Moline, one of the largest manufacturing towns in the West.

The Scranton Steel Company Abroad.

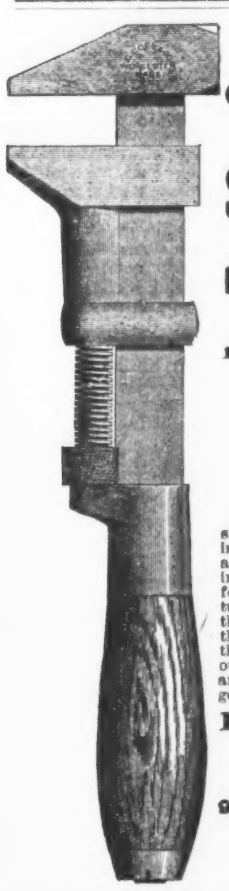
The Scranton Steel Company have reason to feel elated at the very handsome manner in which they have been complimented by I. Lowthian Bell, the eminent English metallurgist, in his book entitled "Principles of the Manufacture of Iron and Steel," recently published. Mr. Bell says: "According to a paragraph which appeared in the Scranton *Republican* of November 10, 1883, the Scranton Steel Company of that locality averaged from one pair of converters 52 blows per turn for a whole week, whereas in England half that number is considered good work. Between 5 a. m. and 4.43 p. m. on one of the turns, as many as 60 blows were made, and from one of the bottoms 42 heats were obtained. The authority quoted from mentions the facts given above as never having been equaled since Bessemer steel was first introduced. The same publication, in its issue of December, 1883, records the production of 288 tons of rails in the Lackawanna Company's mill in one turn, and then goes on to state that in the same period (12 hours) the Scranton Company, with 11 men at the rolls, turned out 318 tons."

In its issue for November 20 the Scranton *Republican* says: "Excellent, however, as was the work mentioned by I. Lowthian Bell, and surpassing the record, as it did at that time, and as it still does, so far as other works go, 52 heats are no longer regarded as even an average work by the Scranton Steel Company, anything under 57 heats in 12 hours being now looked upon as poor work. The company made in September with their two 4-ton converters, running single turn only, 6045 gross tons of ingots, and the rail mill, also single turn, 5424 tons of rails. Last week the steel works made 1523 tons of ingots, all single turn, the rail mill making 1357 tons of rails. On Tuesday, within 12 hours, the works made 274 tons of ingots and 269 tons of rails. The steel works are this week averaging a little over 270 tons per turn. These figures, extraordinary as they appear to Bessemer experts for such small converters, are regarded by the Scranton Steel Company's officials as far below what they are likely to do whenever better times come to tempt them to show what they really can do."

The record lately made is interesting for another reason, namely, that the enterprise and vim have not been beaten out of our steel manufacturers by the hard knocks they have suffered in the past year through excessive competition for business and low prices.

In addition to the figures given above, we have received a report of last week's work, which surpasses everything, showing the very best record ever made for such small converters, both for a 12-hour turn and for a week of six single turns, as follows: On Friday last the steel works made 297 tons of ingots and on Saturday 308 tons, and during the week 1662 tons. The rail mill made 1470 tons of rails. All tons are gross tons.

A Steel Ferryboat.—The new steel ferryboat Atlantic, which is to run on the Hamilton Ferry, between New York and Brooklyn, was launched on the 22d inst. from the Continental Iron Works, foot of Calyer street, Greenpoint, L. I. The Atlantic is the first steel ferryboat ever constructed in this country. Her dimensions are: Length of deck, 195 feet; width, 63 feet. Hull, length on water line, 182 feet; 36 feet 6 inches wide, with a draft of 7 feet, and 13 feet 4 inches from water line up. When finished she will have cost about $125,000. The Brooklyn, a twin boat of the Atlantic, will be launched in about two weeks.



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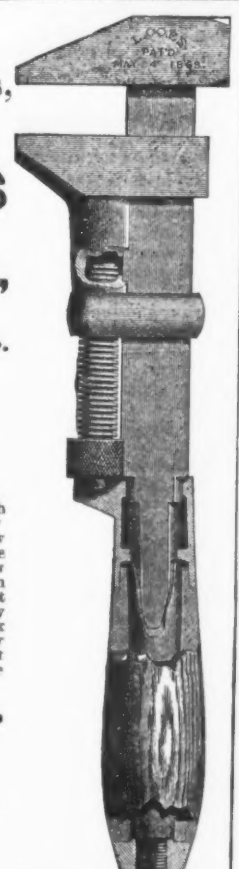

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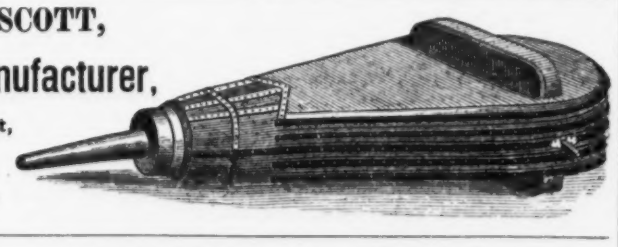

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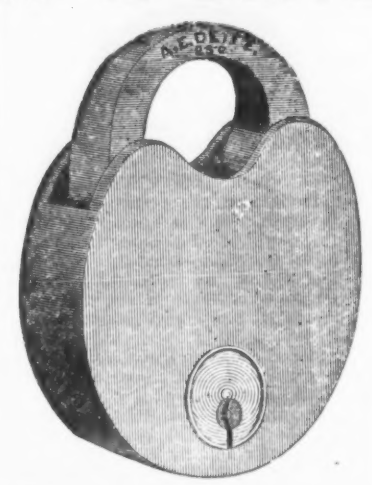

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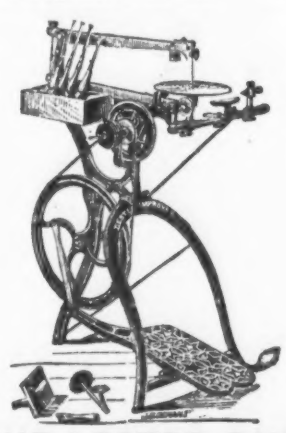

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PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

English Letter.

(*From Our Regular Correspondent.*)

LONDON, November 10, 1884.

THE WEEK

has been fairly quiet in iron circles, with the exception of Glasgow, where there has been a considerable amount of excitement, owing to the failures of four or five firms who had been engaged in large speculative transactions. In one case the stoppage was that of an old and respected firm, and was wholly unexpected. The other defaulters were plungers, one of them being oversold to the tune of something like 60,000 tons, deliveries of which were not forthcoming when due. The general scramble to cover caused quite a run up in values, which rise was caused in no other way whatever—thus once more demonstrating the accuracy of my frequent assertions that the Glasgow warrant market as a trade barometer is utterly unreliable and worthless. This little storm among the Glasgow men will no doubt clear the atmosphere there a little, but it is known that there are still some heavy bear accounts open, the "squaring" of which will probably cause additional troubles. Meantime warrants have relapsed a little from their highest point (43/5 on November 6), and fluctuate daily, according to the varying demand for them. Apart from this, trade and commercial items are scarce, and there is not a great deal worthy of being recorded on behalf of American readers. It may be mentioned, however, that the Presidential election and the victory of the Democrats have been noted here with a good deal of pleasure and satisfaction. These feelings arise in no sense whatever out of the expectation that the reign of the Democrats is likely to benefit Great Britain by means of a lower tariff or otherwise, but is attributable to several other causes. In the first place, Governor Cleveland has the reputation of being honest as well as capable, and all well-wishers of the United States (and these count 99 per cent. of all the Britishers) hope he will be able to rule justly and without pandering too much to the professional politicians. Then, again, his election is recognized as a protest against the dominance of the caucus machine, under the iron pressure of which many persons in this country are beginning to groan. Lastly, there was a general opinion that Mr. Blaine's record was not bright enough for that of the President of the United States, whereas Governor Cleveland's stood out well. Briefly, we Britishers hope and trust you have made a just and wise choice, and we hope that it is one likely to increase rather than diminish the ties of sympathy and affection by which the two great Anglo-Saxon nations are so closely united. We never understood and appreciated the American nation as well as we do to-day, and it is the heartfelt prayer of every decent Britisher that our friendly relations may never be disturbed. We may be rivals in science, arts and commerce, but never, we hope, in respects liable to create bad blood between us.

THE IRON MARKET

has again been without specially noticeable features in the open market, although in Scotch warrants there has been a good deal of speculation for covering purposes. In a general way, however, iron may be termed fairly steady, with a total freedom from excitement or even activity, but with a larger turnover of some importance doing in many departments. The leading foundry, store, &c., houses for instance, report business quite brisk, some of them having been much pressed during the past two or three weeks. With them, as in almost all other cases, the demand appears to run on the cheaper lines of goods, and in these it is larger than for some time previous; but the outlook is believed to afford promise of a steady demand for the remainder of the year. At Glasgow, as already mentioned, warrants have been very lively, and there has been some excitement in the market with ascending values and a considerable number of transactions. The advance is partly attributed to speculative operations and partly to the improved statistical position, coupled with some addition to the consumptive demand. Scotch special brands of pig iron are rather irregular, with advances of 6d. or so in some of the lower grades, and an equal reduction in the brands which went up some time ago.

At Middlesboro' the market is just a shade steadier, but quotations are not changed and remain on the basis of 36/3 @ 36/9 for No. 3, with other numbers pro rata. The returns for October, although not fully satisfactory, are not as bad as had been feared. In hematite pig irons there is no visible vitality, but makers' views are a little firmer, and they ask 6d. @ 1/ more money for long forward deliveries. Meantime West Coast sorts are unchanged at about 43/6 @ 44/6 for mixed lots in usual proportions. Elsewhere all grades of crude iron are inclined to steadiness under the influence of the upward movement at Glasgow, but the consumptive demand does not appear to have been enlarged, and I am unable to report any real improvement in this respect. Spiegeleisen is called about 75/ @ 80/ for 20 % sorts. In heavy iron I have no special alterations to report, save that there is a little more doing here and there in shipplates and angles. The armor-plate departments are fairly engaged for the home and various foreign Governments. In fencing wire business is quiet, both for Australasia and South America, but galvanized iron is in fair request, further orders having been placed recently for Victoria and New South Wales. Ordinary finished iron is quiet, but moderately steady, on the whole, with a good business in sheets and a moderate turnover in tube strips, tank plates, common bars and hoops. Marked bars are still £7. 10/ nominally, and are not in great request. There is a better call for old rails, D. H. iron being 52/6 @ 55/; No. 1 heavy wrought scrap being 40/ @ 42/6; old boiler tubes, 50/ @ 52/6, and old cast iron, 42/6 @ 45/ ₤ ton, net cash, f.o.b. London or other good British port. Freights are practically unchanged, pig iron by ordinary steamers from Glasgow to New York being 2/6 @ 3/ ₤ ton. As to Cardiff and the British Channel ports, Edwardes, Robertson & Co. advise: "The returns for the month of October show some improvement in the shipments to the States, &c., when compared with those of the previous month, arising probably from the low rates of freight now current, which rule from 7/6 to 8/ ₤ ton for weight. These nominal rates are partly caused by the improvement in the rates for cargoes home from America. The superphosphate for Savannah has been shipped from Newport at 8/6 ₤ ton."

Steel is quiet, especially in the crucible branches of Sheffield. The Bessemer and Siemens concerns are fairly engaged in rolled sorts, castings, &c. Old railway leaf spring steel is about 50/ ₤ ton, f.o.b. London, &c. Steel rails are steady, but unchanged in values, which remain on the former basis of £4. 18/6 ₤ ton at the works for ordinary heavy sections. The mills are not fully engaged, and there are rumors afloat that large Italian orders are not unlikely to be placed in Germany before long.

The tin-plate works are almost all fully engaged, but the market is not very strong, and there are persistent reports of new transactions at lower rates. Buyers are pressing for 14/ IC, but the lowest rates accepted appear to be 14/3 for ordinary, 14/9 for Bessemer, and 15/6 @ 15/9 for for Siemens, all IC, ₤ box. Charcoals range from 16/6 to 19/ ₤ box IC. Ternes are dull at 14/, and coke-tin wasters at 13/6 @ 13/9 ₤ box IC.

AMERICAN GOODS IN AUSTRALIA.

Your contemporary, the *Ironmonger* (London), has been interviewing Mr. McLean, of McLean Bros. & Rigg, Melbourne, Sydney, &c., who is now in this country. Mr. McLean says they are agents for the McCormick binder and reaper, and expect to sell 600 machines in Victoria alone, to say nothing of the other colonies. Questioned by the reporter on various other points, Mr. McLean said: "With regard to the binders of English makers, I may be, of course, a little partial, but I don't think that at present, at all events, they have much prospect of a connection with the Australian colonies, for up to now the American manufacturers seem to be having it all their own way; yet all makers have a fair field, as for reapers and self-binders an exception has been made in the tariff and they come in free of duty. Now, with regard to plows and other implements of that kind, the reverse holds good. American plows are no use at all to our people—they are too light; whereas, what our farmers require is a heavy plow, even heavier than is used in England; hence we do a fairly large importation in all the makes of the best houses in this country. With regard to German and American competition with English goods, the Germans are sending us some very nice tools for carpenters, joiners and other like purposes. They are also of a good quality and cheaper than the English tools, and suit the market well for the cheaper class of goods. The Germans, too, are supplying us wire, and are doing a large business in it. In this also the price and quality are found compatible with our requirements. From America we are receiving large supplies of such goods as spades, axes, cheap lampware, carriage woodware, &c., but it can be hardly said to be in competition with England, because the trade is so very different between the two countries. For example, without in the least calling into question the merit of English goods, we could not sell in Australia an English-handled ax or an English hatchet. They must be American, because in appearance and in shape, and in fact in every particular, the American-made article has taken the fancy of the people from the very first. With regard to plated-ware the English manufacturers have nothing to fear, as in American goods the only lines that are imported are the cheaper class of goods plated on Britannia metal. You ask whether we favor foreign goods over English goods? My reply is, certainly not. If we can do so we prefer to stick to the old country, but we have to supply goods to meet the requirements of the colonies, and the Americans have special lines in our business of great advantage to us, such as in woodenware of all kinds, besides the articles previously named. These advantages, you must see, cannot be ignored. The same remark applies, though to a limited extent, to Continental wares, which we are able to get so cheaply on account, I presume, of the low rates of labor obtaining there. We reckon that we build our own locomotive engines, although we have had some from foreign countries, including some from the Baldwin Locomotive Works, of Philadelphia, and, of course, some from England, but the majority of those in hand for running on our lines are being constructed at the Phœnix Foundry, at Ballarat, a large city about 8 miles from Melbourne."

SCOTCH PIG IRON

is alluded to above; consequently, I need not do more here than detail the statistical position. There are 95 furnaces in blast, against 101 a year ago. In Connal's stores there are 580,126 tons, against 588,189 tons this date 1883. Last week's decrease was 411 tons. The shipments to date have decreased by 86,297 tons, while importations of Middlesboro' pig iron into Scotland have decreased by 8396 tons. Quotations for Scotch makers' brands are now about as under:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow	55/6	50/6
Coltness, "	59/6	52/6
Langloan, "	58/	52/
Summerlee, "	54/	47/3
Calder, "	54/	47/6
Carnbroe, "	51/	47/
Clyde, "	48/6	45/3
Monkland, "	44/	41/3
Quarter, "	42/3	40/6
Govan, at Broomielaw	43/3	41/3
Shotts, at Leith	54/6	52/
Carron, at Grangemouth	49/	48
" " specially selected	53/6	....
Kinneil, at Bo'ness	44/	43/
Glengarnock, at Ardrossan	50/6	48/3
Eglinton, "	44/3	41/
Dalmellington, "	48/	43/6

During October about 20,000 tons of new shipping were launched on the Clyde. There are at present about 80 vessels on the stocks, with an aggregate tonnage of 90,000 tons. Orders are decreasing, although iron sailing vessels can be bought at £10. 5/ @ £11. 7/6 ₤ ton, and steel at £11.5 @ £12. 10/ ₤ ton.

MIDDLESBORO' PIG IRON

has been a trifle steadier, but is not quotably changed from recent prices, which are, f.o.b. makers' wharves in the Tees, less 2½ % for cash:

No. 1 Foundry	39/6	Mottled	33/9
No. 2 "	38/	White	33/6
No. 3 "	36/6	Refined Metal	52/6
No. 4 "	34/9	Kentledge	39/
No. 4 Forge	34/3	Cinder	32/6

The official returns for October of the Cleveland Ironmasters' Association show that the total make of pig iron of all kinds was 201,087 tons, against 196,306 tons in September, and that stocks aggregate 287,981 tons, against 288,155 tons in September. The foreign shipments were some 2000 tons less than in September.

HEMATITE PIG IRON

is quiet, but is a little firmer, with a good business reported at about 44/ ₤ ton. In some cases 44/6 is now asked for mixed lots in usual proportions. The West Coast brands stand as given hereunder:

	No. 1.	No. 2.	No. 3.
Cleator	45/6	45/3	45/
Lonsdale	45/	44/6	44/
Workington	44/6	44/	43/6
West Cumberland	44/6	44/	43/6
Lowther	45/	44/6	44/
Distington	44/6	44/	43/6
Harrington	45/6	44/6	43/6
Solway	44/6	44/	44/6
Maryport	44/6	44/	43/6

Quotations for North of England sorts, f.o.b Cumberland ports, &c., are as below:

No. or quality.	Ordinary.	Bessemer.
1		45/
2		44/6
3		44/
4 Foundry		44/
4 Forge		43/6
Mottled		43/
White		43/

THE BOARD OF TRADE RETURNS

for October show that our imports were of the value of £31,097,132, as against £35,833,755, or a decrease of £4,736,623. On the ten months ending October 31 the decrease was £29,170,288. The months' exports were valued at £20,414,162, against £21,138,859 in the same month of last year, and £20,877,713 in October, 1882. On the ten months the exports have decreased by £3,420,685.

To the United States the figures are:

Articles.	Month of October, 1884.	Month of October, 1883.	Month of September, 1884.
Alkali, cwt	259,196	307,384	356,286
Hardware & cutlery, £	25,985	39,285	24,860
Iron—Pig, tons	10,723	26,748	15,094
Bar, angle, rod, &c. tons	219	260	249
Railroad, all, tons	351	5,919	83
Hoops, sheets, plates &c., tons	2,638	2,859	1,109
Tin plates, "	15,690	21,317	18,371
Cast or wrought "	72	380	204
Old "	1,636	2,236	3,307
Steel unwrought "	1,181	907	1,482
Lead, all sorts "	76	10	76
Steam engines, £	3,290	3,271	1,129
Other machinery, &c £	26,134	30,049	24,142
Tin, unwrought, cwt	260	708	20
Special return — Iron rails, tons	....	24	7
Steel rails "	351	5,575	....

INDUSTRIAL ITEMS.

NEW YORK.

Richard C. McCormick, Oscar Marshall and Henry P. Bntler are the incorporators of the Sims Electric Torpedo Company, of New York, which has a capital stock of $1,000,000, and is to manufacture torpedoes, war ships, &c.

In the latter part of October the charcoal furnace of the Carthage Iron Company was burned in a conflagration that swept away almost the whole town of Carthage. It is reported now that the proprietors of the furnace believe there will be no immediate use for it, owing to the gloomy outlook for the iron trade, and are pulling it down, preparatory to building a saw mill, and thus using the fine water-power at their command. That section has some valuable iron-ore mines. Over $150,000 has been expended in building a railroad from Carthage to the most important of these mines. The road is graded and ready for track-laying more than half the way, but not a man is now at work on it.

Amidon & White, bit-brace manufacturers, of Buffalo, are running 22 of the 24 hours a day, with an increased force of men, to supply the demand for their Amidon corner brace. They are making preparations for additions to their works which will largely increase their present capacity for manufacturing.

PENNSYLVANIA.

We have received the following items from Chester: At Robert Wetherill & Co.'s over 200 hands are employed, principally in the production of Corliss engines. The firm have just shipped a 300-horse-power Corliss engine to the New Orleans Exposition, and it will be used there for the running of the textile exhibit. They have also nearly completed two engines for new carpet mills in Philadelphia. The Standard Steel Casting Company are running two heats per week and are making steel car-wheels for the Pennsylvania Railroad, and also steel rolls for rolling mills at Chester and Reading to replace the chilled iron ones now in use. The works of the Eureka Steel Casting Company, at Lamokin, are also running, but not to their full capacity. The same may be said of the Chester Rolling Mills, at which place ship-plate iron is the principal production. A large number of hands are still employed at Roach's shipyard in completing the United States cruisers. The Boston, the sister ship to the Atlanta, will be ready for launching before the close of the year.

In regard to the recent assignment of Dr. S. C. Baker, of Allegheny Furnace, the Altoona *Tribune* says: Allegheny Furnace will be run until the stock now on hand is used up. Work at the ore banks owned by Dr. Baker was stopped on Saturday. At the furnace there is a large amount of pig iron on hand. The Altoona Iron Works and the Altoona Car Works will not be affected by the failure, the doctor having disposed of a large part of his interest in both establishments some time ago. The Altoona Coal and Coke Company is an incorporated company, and is therefore not likely to be affected.

The Union Foundry and Machine Company, of Catasauqua, on Monday last placed the employees of the pattern, machine and blacksmith departments on reduced time, or eight hours per day, owing to scarcity of orders. This materially reduces the wages, but is necessitated by the dullness of trade.

At the sheriff's sale of the Kemble Coal and Iron Company's property in Bedford County on November 18, the proceeds amounted to $40,000. This includes all the land, iron ore, coal, limestone, mining rights and privileges and improvements on real estate. The Riddlesburg property, including two furnaces, coke ovens, &c., was knocked down at $25,500. The entire property was estimated at a value of not less than $1,000,000. The property was purchased for a number of gentlemen in Pittsburgh and New York, who have already signed articles for a corporation.

Charlotte Furnace, at Scottdale, will resume operations this week. She has been out of blast since last July.

The West Hamburg Rolling Mill has gone on single turn, in consequence of the depression in the iron market. Since the election numerous orders have been countermanded, and other causes have rendered it necessary to dispense with one-half of the usual number of employees.

The mills of the Glasgow Iron Company, at Pottstown, shut down on November 15 for want of work.

Van Alen & Co., of Northumberland, are constructing one of M. V. Smith's 30-ton nail-plate heating furnaces, and the Danville Nail and Manufacturing Company are constructing a second one of his improved regenerative-gas heating furnaces.

J. P. Witherow & Co.'s Whitwell Stove Works of this city, no matter how other establishments may be situated, go booming right along. The company are now engaged in filling one $305,000 order, one of $97,700 and one of $3000. These orders were further supplemented Monday by a contract for furnace stoves for the Lochiel Furnace which will amount to $30,000. The firm have orders on hand amounting in all to nearly $450,000. —*New Castle Guardian.*

The Sharon Iron Company have discontinued operations at their works, thus throwing 400 men out of employment. It is not known when they will resume.

PITTSBURGH AND VICINITY.

The machinery molders employed at Robinson, Rea & Co.'s works were last week notified of a reduction of 10 per cent. in their wages. While the stove molders of Pittsburgh were reduced 15 per cent. several months ago, the machine men continued to work at their old wages. It has not yet been decided whether the reduction will be accepted. The lowest rate of wages paid by the firm is $2.50, and many of the men are getting $3. The employees will hold a meeting to discuss the reduction.

Wilson, Walker & Co. and Carnegie Bros. & Co. have been troubled considerably during the week because of an insufficient supply of natural gas. It seems the scarcity is occcasioned by breaks at different places along the main line, which have been difficult to locate. For several mornings past the supply gave out entirely, causing the employees to lose two heats on the day and five on the night turn. At Wilson, Walker & Co.'s works the men have lost all patience, and a number of them are clamoring for a more reliable fuel. It is intimated that the firms affected will sue the gas company for breach of contract.

A committee representing the employees of the Standard Nut Works, on the Southside, held a meeting on November 17, to consider whether to accept the proposed reduction of 15 per cent. or not. The nut feeders have been idle for the last five weeks, and the firm have been receiving material from Cleveland to run the works with. Some of the men favored accepting the reduction, but others argued that, as the wire drawers had resumed by compromising at 10 per cent., the nut feeders could probably effect a compromise at 8 per cent. Nothing definite could be decided upon, and the meeting adjourned.

A lively gas war is predicted between the Philadelphia (Westinghouse) Company and the Fuel Gas Company, with regard to territory, &c., in Pittsburgh. The latter company, with which Dr. Hostetter is identified, are said to be backed by the Standard Oil Company.

The Westinghouse Machine Company have received an order from Scotland for a steam engine. It will be used on one of the iron-clads of the British Navy. The use to which the engine will be applied is in operating the electro-dynamo from which electricity is obtained for incandescent lamps throughout the entire ship, which are for signal or danger lights.

Jones & Laughlins' gas well is gradually becoming stronger. Last week the gas was ignited from two openings from a 3-inch pipe, and it burned 20 feet on each side. Owing to the success met with here, it is probable that Moorhead & Co. will drill their well deeper. It was abandoned last Monday week at a depth of 2000 feet.

The property owners of Verona borough have donated 1½ acres of ground to a company that propose erecting a novelty works on the site.

The nail department of Chess, Cook & Co.'s mill, Southside, was put in operation on November 17, after having been shut down for over a month.

William Hainsworth, of the Pittsburgh Steel Casting Company, has invented a new method of producing heavy steel forgings, such as ordnance of large caliber, marine shafts, tubes, armor plates, &c. By his system the initial heat of the ingot is preserved. It is forged by compression or rolling while in a vertical position. The heating is done in an elevated gas furnace, and directly under the vertical heating chamber are situated iterated rolls and presses, and below the floor level a deep cylindrical reservoir for gradually cooling or tempering in oil, as desired. The object aimed at is to produce steel forgings (however large) without blemish, and recent experiments satisfy Mr. Hainsworth that by his system rapid forging at a uniform heat can be accomplished, all strains avoided and the metal improved in strength and durability.

The partnership under the firm name of King, Son & Co. having expired by limitation, the firm has been reorganized as King, Son & Co., Limited, under the limited partnership laws of the State.

OHIO.

The Cleveland Rolling Mill Company started up their works in full force on November 17, 3500 men being employed.

It is said that a well-known capitalist here will purchase the plant of the Malleable Iron Works and start it in operation.—*Youngstown News-Register.*

The Cuyahoga Steam Furnace Company, Cleveland, have resumed operations after a two weeks' stoppage, during which numerous repairs and improvements have been made.

The mill of the Westlake Iron Company, at Warren, is still idle, with but little prospect of the fires being lighted.

W. H. Banks, manager of the Standard Bolt Works, of Chicago, is in Youngstown for the purpose of conferring with rolling-mill manufacturers, with the object of building a plant to take the iron while it is heated from the rolls and transform it into bolts, thus saving the expense of reheating. Should arrangements be perfected the company will erect bolt works which will give employment to a large number of men.

Says the Ironton *Register:* As an instance of the instability of human concerns we may allude to the Union Iron Company, the sale of whose property we noted last week. About 15 years ago John Peters sold his interest, amounting to $\frac{6}{16}$, to the other partners for $300,000, clear cash. Now the property sells at receiver's sale for $76,000, or about one-fourth of what one-half sold for 15 years ago.

The Wellston *Argus* says: We have it from reliable authority that the entire property of the Wellston Coal and Iron Company lying in and around this place has been sold to McClintick & Smith, of Chillicothe. The sale includes the furnace, coal shafts Nos. 1 and 2 and all the coal lands belonging to the W. C. & I. Co. We are told that the new company will sink new coal shafts and greatly increase the capacity of the mines here in that line.

MISSOURI.

The St. Louis Stamping Company are at present employing 1100 hands.

The St. Louis Sash Weight Company are making a daily output of 1000 weights, and report business good.

The Helmbacher Forge and Rolling Mill Company have started up two of their axle hammers, and state that trade is improving.

ILLINOIS.

The Cross Press and Sign Company, of Chicago, manufacturers of signs, wood printing presses and brass dies, who were recently burned out at Nos. 1,446-8 Wabash avenue, have again commenced business at No. 50 Michigan street, with a full line of material and machinery. Their stock, &c., at their former place was valued at $10,000 and insured for $6000.

Messrs. Richards, Brown & Co., of Chicago, have recently shipped 10 tons of Lake Superior charcoal pig iron to a point in California within a short distance of San Francisco. The freight on this shipment was 84½ cents per hundred, or within a fraction of $19 per gross ton. The same firm have within the last two months shipped 80 tons to Western Montana, which had to be hauled 250 miles in wagons after being taken from the cars. This was the second lot to these parties. The iron is used for making stamps for crushing ore.

WEST VIRGINIA.

Owing to the prevalent dullness in the iron trade, the Crescent Sheet Iron Mills, of Wheeling, will hereafter only run four days out of each week. One-third of the boilers employed there were discharged, and several other employees have been notified that their services are no longer required.

Submarine Wires.—It is estimated that the aggregate length of submarine cables in existence is no less than 60,000 geographical miles, or nearly three times as much as the circumference of the earth. Each of these cables consists, on an average, of 40 wires, core and jacket together; therefore, it may be said that the length of iron and copper wire by which telegraphic communications are carried on at the bottom of the sea is no less than 25,000,000 miles, or 10 times the distance of the earth from the moon.

On Friday last, says an exchange, a large scow, on which was a patent freezing machine, was towed to the brewers' wharf at Stapleton, Staten Island, near New York. The machine was valued at $80,000, and was intended for one of the large Staten Island breweries. Workmen began carrying the parts of the apparatus off the scow. They took only from one side, and the scow, of course, careened considerably in consequence. A passing ferryboat sent a heavy swell along, the scow lurched more than before, the machinery shifted and tilted the craft still further. In an instant $50,000 worth of fine machinery was deposited in the bottom of the Narrows.

The coroner's jury which has been investigating the causes of the accident by which the new furnace stack of Ferguson, White & Co., at Robesonia, Berks County, Pa., fell in a heap a week or two ago, causing the death of seven workmen and injuring five others, has rendered a verdict that the accident was caused by the giving way of the foundations upon which the iron columns rested. It appears that a spring of water has been discovered under the foundations. The jury says nothing about the dynamite explosion a dozen miles away, just before the furnace fell, from which omission it is to be inferred that no relation has been established between the two occurrences.

Wholesale Hardware Prices, November 26, 1884.

HARDWARE.

Anvils.
Eagle Anvils American....₩ lb 10¢—dis 20 %
Wright's....10 @ 10½¢
Armitage's Mouse Hole....9½¢ @ 9¾¢
Armitage Mouse Hole, Extra....11¼¢
Trenton....9½¢
Wilkinson's....9½¢
J. & Riley Carr, Patent Solid....11@11½¢

Anvil Vise and Drill.
Millers Falls Co., $18.00....dis 20 %
Cheney Anvil and Vise....dis 25 %

Apple Parers.
Advance....₩ doz $5.75
Champion....₩ doz $8.25
Family Bay State....₩ doz $12.00
Gem....₩ doz $5.25
Gold Medal....₩ doz $5.00—dis 10 %
Improved Bay State....₩ doz $30.00
Improved Bay State, with push off....₩ doz $33.00
Jersey....₩ doz $7.50—dis 25 %
Little Star....₩ doz $5.50
New Lightning....₩ doz $7.00
Oriole....₩ doz $7.50—dis 30 %
Penn....₩ doz $5.50
Rocking Table....₩ doz $7.00
Triumph....₩ doz $5.50
Turntable, Original....₩ doz $5.50
Turntable, Improved....₩ doz $6.50
Waverly....₩ doz $5.00—dis 10 %
White Mountain....₩ doz $5.50
"1872"....₩ doz $4.50
"1876"....₩ doz $5.75
"1878"....₩ doz $7.00

Augers and Bits.
First Quality....dis 60@60&10 %
Cook's, Douglass Mfg. Co....dis 55 %
Cook's, New Haven Copper Co....dis 50&10 %
Cook's, Ives'....dis 60 %
Patent Solid Head....dis 30 %
Lewis' Patent Single Twist....dis 45 %
Russell Jennings' Augers and Bits of all kinds, List of January 1, 1884....dis 25 %
Imitation Jennings' Bits (old list)....dis 60 %
Ives' "Jennings'" Bits (old list)....dis 50&10 %
Car Bits, Snell Mfg. Co....dis 40&10&10 %
Car Bits, New Haven Copper Co....dis 50&10 %
Snell Mfg. Co.'s Jennings' Bits (Jennings' list)....dis 50&5 %
Expansive Bits, Clark's small, $18; large, $26..dis 25&10
Expansive Bits, Ives' No. 4, per doz., $60....dis 25&10 %
Expansive Bits, Blake's....$20—dis 40 %
Expansive Bits, Ansonia....dis 25 %
Hollow Augers, Ives' / Hollow Augers, French, Swift & Co. / Hollow Augers, Douglass' } dis 25&10 %
Hollow Augers, Bonney's Adjust, ₩ dz. $48..dis 40&10 %
Hollow Augers, Stearns' Adjust. ₩ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 40&10 %
Hollow Augers, Universal Expan., each, $4.50—dis 20 %
Wood's....dis 25 %
Gimlet Bits....$7.50 ₩ gross, dis 50 %
Gimlet Bits, Diamond....₩ doz. $1.10, dis 25&10 %
Gimlet Bits, "Bee"....dis 25 %
Double Cut Gimlet Bits, Shepardson's....dis 45 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co..dis 30&10 %
Double Cut Gimlet Bits, Hartwell's....dis 60 %
Double Cut Gimlet Bits, Douglass'....dis 40 %
Double Cut Gimlet Bits, Ives'....dis 50 %
Holtz Bit Stock Drills....dis 25&10 %
Syracuse Twist Drill Co., Wood Drills....dis 30 %
L'Hommedieu's Ship Augers....dis 15 %
Watrous's Ship Augers....dis 15 %
Snell's Ship Augers....dis 15 %

Awl Hafts.
Sewing, Brass Ferrule....$3.50 ₩ gross—dis 40&10 %
Patent Sewing, Short....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long....$1.20 ₩ doz.—net
Patent Peg, Plain Top....$10.00 ₩ gross—dis 40&10 %
Patent Peg, Leather Top....$12.00 ₩ gross—dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common....₩ gross $1.70—dis 25&10 %
Awls, Shouldered Peg....₩ gross $2.45—dis 25&10 %
Awls, Patent Peg....₩ gross 63¢—dis 25&10 %
Awls, Shouldered Brad....$2.70 ₩ gross—dis 25&10 %
Awls, Handled Brad....$7.50 ₩ gross—dis 25&10 %
Awls, Handled Scratch....$7.50 ₩ gross—dis 25&10 %
Awls, Socket Scratch....$1.50 ₩ doz—dis 25 %
Aiken's Sets, Awls & Tools...₩ doz. $10.00—dis 50&10 %
Millers Falls Adj. Tool Handles....₩ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 1....₩ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 2....₩ doz $18—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. / Brad Sets, Stanley's Excelsior, No. 2, $4.00. / Brad Sets, Stanley's Excelsior, No. 3, $5.50. } dis 25&10 %

Axes.—Best grades.
Regular....per doz $6.50@$7.00
Double Steel, Bronzed....add .75
Triple Steel, Bronzed....add 1.00
Steel Pole, Bronzed....add 1.00
Full Polished....add .50
Beveled....add .50

Double Bit Axes.
Regular, Bronzed....per doz $12.00
Steel Pole, Bronzed....add 1.00
Full Polished....add 1.00
Beveled....add 1.00

Axle Grease.
Frazer's, in bulk....Keg ₩ lb, 5¢; Pail, ₩ lb, 6¢ net
Frazer's, in boxes....₩ gross $10.00 net
Axles.—Common....₩ lb, 3½¢
Fine Axles....dis 60 %

Balances.
Spring Balances....dis 40&10 %

Bells.
Hand, Light Brass....dis 75&10@75&10&5 %
Hand, Extra Heavy....dis 60@65 %
Hand, White Metal....dis 70 %
Hand, Silver Chime....dis 20&10 %
Hand, Globe (Cone's Patent)....dis 25&10 %
Gong, Abbe's....dis 33⅓ %
Gong, Yankee....dis 45 %
Gong, Barton's....dis 40&10 %
Crank, Taylor's....dis 25&10 %
Crank, Brooks'....dis 50&10&2 %
Crank, Cone's....dis 10 %
Crank, Connel's....dis 15&10 %
Lever, Sargent's....dis 55&10 %
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned....dis 25&10 %
Lever, R. E. M. Co.'s....dis 50&10&2 %
Lever, Reading....dis 25&10&10 %
Pull, Brook's....dis 50&10&2 %
Pull, Western....dis 25&10 %
Call....dis 40 %
Cow, Common Wrought....dis 60&10 %
Cow, Western....dis 20&10 %
Cow, Western, Sargent's new list....dis 60&10&10 %
Cow, Kentucky "Star"....dis 20&10 %
Cow, Kentucky, Sargent's new list....dis 60&10&10
Cow, Dodge, Genuine Kentucky, new list—
Nos. 1 1½ 2 3 4 5 6 7 Hog
$10.00 9.00 8.00 6.00 5.00 4.00 3.00 2.50 5.00 } dis 70 %
Cow, Texas Star....dis 50 %
Farm Bells....₩ lb, 3½¢
Steel Alloy Church and School Bells....dis 40 %

Bellows.
Blacksmiths'....dis 50@50&10 %
Molders'....dis 50 %
Hand Bellows....dis

Belting, Rubber.—Standard....dis 70@70&5 %
Extra....dis 60@60&5 %
N. Y. Belting & Packing Co., Standard....dis 50&10 %
N. Y. Belting & Packing Co., Extra Standard..dis 50 %

Bench Stops.—Hotchkiss's...₩ doz $5.00—dis 10 %
Weston's....per doz No. 1, $10; No. 2, $9—dis 25&10 %
McGill's....₩ doz $3—dis 10 %
Morrill's....₩ doz $9—dis 50 @ 50&5 %

Bit Holders.
Extension, Barber's....₩ doz $15.00—dis 40&5 %
Extension, Ives'....₩ doz $20.00—dis 40 %
Diagonal....₩ doz $24.00—dis 40 %
Angular....₩ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic....₩ per doz $3.00—dis 30 %
Excelsior....₩ doz $16.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's....₩ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern....$9 ₩ gro.—dis 20 %
Van Sand's Old Pattern....$9 ₩ gro.—dis 20 %
Washburn's Old Pattern....$9 ₩ gro. net
Merriman's....new list, net
Salisbury & Austin No. 2008....$9 ₩ gro. net
Security Gravity....$9 ₩ gro. net

Blind Staples.
Barbed, ½ in. and larger....₩ lb 9½¢ net
Barbed, ⅜ in....₩ lb 11½¢ net

Blocks.
Tackle Blocks, &c....dis
Reed Mfg. Co. Self-Lubricating....dis 50 %

Bolts.
Cast Iron Barrel, Square, &c....dis 60&10&10 %
Cast Iron Shutter Bolts....dis 60&10&10 %
Cast Iron Chain (Sargent's list)....dis 60&10&10 @ 70 %
Ives' Patent Door Bolts....dis 55&10 %
Wrought Barrel....dis 55&10&10 %
Wrought Square....dis 55&10&10 %
Wr't Shutter, all Iron, Stanley's list....dis 50&10&10 %
Wr't Shutter, Brass Knob, Stanley's list.dis 25&10&10 %
Wrought Shutter, Sargent's list....dis 55&10&10 %
Wrought Sunk Flush, Sargent's....dis 60&10 %
Wrought Sunk Flush, Stanley's....dis 40&10 %
Wrought B. K. Flush, Com'n Stanley's....dis 55 %
Tire, Common, list Feb. 28, 1883....dis 70 %
Carriage, Com., list June 10, '84....dis 75&10@75&10&5 %
Carriage, Philadelphia....dis 75 %
Carriage, Philadelphia pattern....dis 75&10 %
R. B. & W., Carriage, old list....dis 70&5 %
Tire, Norway, Phil., list Oct. 16, '84....dis 80 %
Tire, Eagle, Phil., list Oct. 16, '81....dis 82½ %
Tire, R. B. & W., Philadelphia list Oct. 16, 1884.dis 80 %
Stove....dis 60@60&5 %
Plow....dis 60 %
Plow, R. B. & W....dis 50 %
Machine....dis 75&10 @ 75&10&5 %
Bolt Ends....dis 75&10 @ 75&10&5 %

Borax....10½¢ @ 11½¢ ₩ lb net

Boring Machines.

	Upright.	Angular.
First quality, no Augers	$5.50	$5.75..dis 50@50&5 %
Phillips, with Augers	7.00	7.50....net
Jennings & Co., no Augers	5.50	6.75....dis 45 %
Saunders' Pat., Reg. Bed	6.00	—....dis 20 %
Saunders' Pat., Extra Bed	6.50	—....dis 20 %
Hubbard's	2.50	3.00....Net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2....dis 60 %
Humason, Beckley & Co.'s other Nos....dis 70 %

Sargent & Co.'s....$19 70 and $21.40, dis 60&10 %
Hotchkiss....dis 30 %
Peck, Stow & W. Co....dis 30&10 %

Braces.
C. S. Backus....dis 50&10 %
Barber's....dis 40&5 %
Spofford's Patent....dis 50&5 %
Ives' Patent Braces....dis 55&10 %
Common Ball, American....dis 55 %
Amidon's....dis 50 %
Bartholomew's, Nos. 25, 27, 30....dis 50 %
Bartholomew's, Nos. 117, 118, 119....dis 60 %
Barker's Imp'd....dis 60 %
Amidon's Corner Brace....dis 30&10 %
Universal....dis 55 %
Empire....dis 30 %
Buffalo Ball....dis 40 %

Brackets.
Shelf, plain....dis 50&10&10 %
Shelf, fancy....dis 60&10 %
Reading, plain....dis 55&10&10 %
Reading, Rosette....dis 60&10&10 %

Bright Wire Goods
List of June 25, 1883....dis 75&10@80 %

Broilers.—Henis' Self-Basting.

Inch	9	10	9 x 11
Per doz.	$4.50	5.50	6.50

Bull Rings.
Union Nut Co....dis 55 %
Sargent's....dis 60&10 %
Hotchkiss' low list....dis 30 %
Humason, Beckley & Co.'s....dis 70 %
Peck, Stow & W. Co.'s....dis 33⅓&10 %

Butts
Wrought Brass....dis 80 %
Cast Brass, Tiebout's....dis 40 %
Cast Brass, Corbin's Fast Joint....dis 20&10 %
Cast Brass, Loose Joint....dis 10&10 %
Fast Joint, Narrow....dis 60&10 %
Fast Joint, Broad....dis 60&10 %
Loose Joint....dis 70@70&10 %
Loose Joint, Japanned....dis 70@70&10 %
Loose Joint, Japanned with Acorns....dis 70@70&10 %
Parliament Butts....dis 70@70&10 %
Mayer's Hinges....dis 70@70&10 %
Loose Pin, Acorns....dis 70@70&10 %
Loose Pin, Acorns, Japanned....dis 70@70&10 %
Loose Pin, Acorns, Jap'd, Plated Tips..dis 70@70&10 %

WROUGHT IRON.
Fast Joint, Narrow....dis 60&5&10 %
Fast Joint, Lt. Narrow....dis 60&5&10 %
Fast Joint, Broad....dis 60&5&10 %
Loose Joint, Broad....dis 60&10&10 %
Table Butts, Back Flaps, &c....dis 60&5&10 %
Inside Blind, Regular....dis 60&5&10 %
Inside Blind, Light....dis 60&5&10 %
Loose Pin, Wrt....dis 60&10&10 %
Loose Pin, Light....dis 60& 5&10 %
Bronzed Wrought Butts....dis 40&5 @ 40&10 %
Spring Hinges:
Geer's Spring and Blank Butts....dis 33⅓ %
Union Spiral Spring, Japanned....dis 25 %
Union Spring Hinge Co.'s....dis 25 %
American Spring Hinge Co.'s....dis 30 %
Gem Spring Hinges....dis 30 %
Barker's Double Acting....dis 20&10 %
Union Mfg. Co....dis 25 %
Bommer's....dis 25 %
Buckman's....dis 25 %
Empire....dis 60 %
Acme....dis 70 %
Climax....dis 50&10 %
Blind Butts, Parker....dis 75&2 %
Blind Butts, Palmer....dis 50&5&10 %
Blind Butts, Seymour....dis 70&2 %
Blind Butts, Lull & Porter....dis 80&10 %
Blind Butts, Nicholson....dis 45&10 %
Blind Butts, Huffer....dis 50 %
Blind Butts, Clark's, Nos. 1, 3, 5....dis 75&10&2 %
Blind Butts, Manhattan Hardware Co....dis 75 %
Blind Butts, Sargent's, Nos. 1, 3....dis 75&10 %
Blind Butts, Sargent's, No. 12....dis 75&10&10 %
Blind Butts, Reading's Gravity....dis 75&10 %
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55....dis 75&10&2 %
Blind Butts, Shepard's "Gravity," Nos. 1, 3 and 5....dis 70&10&10 %
North's Automatic Blind Fixtures, No. 2, for Wood, $9; No. 3, for Brick, $10.50.
Shepard's Lull & Porter Shutter Hinges.dis 70&10&5 %
Shepard's Reversible Shutter Hinges....dis 70&10&5 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3....dis 60&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co....dis 25 %
Bradley's....dis 25 %
Beatty's....dis 33⅓&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s....dis 40 %

Calipers....See Compasses

Can Openers.
Messenger's Comet....₩ doz $3.00, dis 25 %
American....₩ gross $8.00, dis 30 %
Duplex....₩ doz 25¢, dis 15 @ 20 %
Lyman's....₩ doz $3.75, dis 20 %
No. 4, French....₩ doz $2.25, dis 55 %
No. 5, Iron handle....₩ gross $8.00, dis 30 %
Eureka....₩ doz $2.50, dis 10 %
Sardine Scissors....₩ doz $7.00, dis 55 %
Star....₩ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50.dis 50&10 %
"World's Best," ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00....dis 50&10 %
Universal....₩ doz $3.00, dis 35&5 %
Domestic....₩ doz $2.50, dis 45 %
Champion....₩ doz $2.00, dis 50 %

Caps—Percussion, ₩ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's....50¢
E. B. Trimmed Edge, 1-10's....65¢
E. B. Ground Edge, Central Fire, 1-10's....70¢
Double Waterproof, 1-10's....$1.40
Pistol Waterproof, 1-10's....75¢
Musket Waterproof, 1-10's....80¢ } dis 20&5 %
G. D....28¢
S. B....30¢
Eley's E. B....57¢
Eley's D. Waterproof, Central Fire....$1.50
U. M. C., F. C. trimmed....50¢ / U. M. C., F. L. ground....70¢ } dis 15&10 %
U. M. C., Cen. fire ground....70¢ / U. M. C., Double W. Proof....$1.40 } dis 10&5 %
Double Waterproof, in 1-10's....$1.40 / Colt's Pistol, in 1-10's....75¢ } dis 10 %
Musket, in 1-10's....50¢

Cartridges.
Rim....List of Jan. 1, 1884—dis 50&10@60 %
Central Fire.... " " " dis 33⅓@40 %

Cards.
Horse and Curry....dis 10 %
Cotton....New list, Aug., 1883, dis 10 %
Wool.... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished....₩ doz $5.00, dis 30 %
Cast Iron, Steel Points....₩ doz $2.00, dis 50&5 %
Socket....₩ doz $2.50, dis 25 %
Bullard's....dis 25 %

Carpet Sweepers.
Bissell No. 5....₩ doz $17.00
Bissell No. 7 New Drop Pan....₩ doz $19.00
Bissell No. 12 Hall Sweeper....₩ doz $42.00
Mystic....₩ doz $17.00
Cottage....₩ doz $15.00
Garland....₩ doz $19.00
Queen....₩ doz $16.00
Queen, with band....₩ doz $18.00
King....₩ doz $30.00

Casters.
Bed / Plate / Shallow Socket } dis 60 %
Deep Socket....dis 45 %
Yale Casters, reduced list May, 1884....dis 25@25&10 %
Martin's Patent (Phœnix)....dis 40&10 %
Payson's Anti friction....dis 60 %

Cattle Leaders.
Humason, Beckley & Co.'s....dis 70&10 %
Sargent's....dis 60&10 %
Hotchkiss....dis 30 %
Peck Stow & W. Co....dis 33⅓&10 %

Chain.
Trace, 6½-10-2....₩ pair 79¢ / Trace, 6½-10-3....₩ pair 70¢ / Trace, 7-10-2....₩ pair 86¢ } dis 50&10 %
German Halter Chain, list of June, 1884....dis 55&5 %
German Coil, list of June, 1881....dis 55&5 %

	3-16	¼	5-16	⅜	7-16	½
English Coil	$0.10	.08½	.07¼	.06½	.06	.05¾
American Coil	$0.9¼	.08¾	.06	.05¼	.05	.04¾

Covert Halter, Hitching and Breast....dis 35&5 %
Meneely's Breast, Halter and Hitching....dis 50&10 %
Oneida Halter Chain (old list)....dis 45 %
Galvanized Pump Chain....₩ lb 6½¢
Jack Chain, Iron....dis 70 %
Jack Chain, Brass....dis 65&10 %

Chalk.
White....₩ gro 60¢ net
Red....₩ gro 80¢ net
Blue....₩ gro 95¢ net
White Crayons....₩ gro 9¢ net
Chalk Lines.—See Lines.

Chisels.
Socket Framing, Firmer, &c....dis 75@75&5 %
Socket Framing, Crossman....dis 65&5 %
Socket Framing, &c., Douglas....dis 70&10 %
Socket Framing and Firmer, Buck Bros....dis 30 %
Socket Framing and Firmer, Merrill....dis 65&10 %
Socket Firmer, Framing, &c., L. & I. J. White..dis 25&5 %
Tanged Firmers....dis 45&5 @ 50 %
Tanged Firmers, Butcher's....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's....$5.00 to £
Tanged Firmers, Buck Bros....dis 30 %

Clamps.
Iron, Providence Tool Co.'s Wrought Iron....dis 25 %
Iron, Adjustable, Gray's....dis 20 %
Iron, Adjustable, Lambert's....dis 20 %
Iron, Adjustable, Snow's....dis 40&5 %
Iron, Adjustable, Hammer's....dis 15 %
Iron, Adjustable, Stearns'....dis 20&10 %
Iron, Cabinet, Sargent's....dis 70&10 %
Iron, Carriage Makers', Sargent's....dis 65&10&10 %
Iron, Eberhard Mfg. Co....dis 40&5 %
Saw Clamps....See Vises

Clips, Axle.
Norway or Best....dis 60&10 %
Superior....dis 70&10 %

Coal Vases.
Buffalo Palace, S. S. & Co....dis 30&10 %
Buffalo Common, S. S. & Co....dis 30&10 %

Cockeyes....dis 50 %

Cocks, Brass.
Racking....dis 60 %
Globe....dis 60 %
Plain Bibbs....dis 60 %
Ale and Beer....dis 60 %

Coffee Mills.
Board and Box....dis 40 @ 40&10 %
Selsor's Patent....$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co....dis 20&10 %
The "Swift," Lane Bros....dis 20&10 %
Webb's Patent....dis 45 %

Compasses, Dividers, &c
Compasses....dis 60&10 %
Calipers....dis 60&10 %
Dividers....dis 60&10 %
Bemis & Call Co.'s Dividers....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)....dis 30 %
Excelsior....dis 50 %
Cook's Extension....dis 25 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's....dis 20 %
Barton's....dis 25 %
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %
John Beatty & Co....dis 33⅓ %

Corkscrews.
Humason & Beckley Mfg. Co....dis 40 %
Clough's Patent....dis 33⅓ %

Corn Knives and Cutters.
Bradley's....dis 10 %
Wadsworth's....dis 25 %

Crow Bars.
Cast Steel....₩ lb 5¢
Iron, Steel Points....₩ lb 3¼¢

Curry Combs.
Fitch's....dis 50&10 %
Hotchkiss, Novelty, new list, July, 1880....dis 33⅓ %
Hotchkiss, Excelsior Supr. Champion....dis 33⅓ %
Rubber....₩ doz $10.00, dis 25 %

Curtain Pins.
Silvered Glass....net
White Enamel....net

Cutlery.
American Pocket....Net prices
American Table....Net prices
Wostenholme....$8.00 to £

Dividers....See Compasses

Dog Collars.
Embossed Gilt....dis 30&10 %
Leather....dis 40 %
Brass....dis 40 %

Door Springs.
Torrey's Rod, regular size....₩ doz $3, dis 50 %
Gray's....₩ gro, $20.00, dis 20 %
Bee Rod....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30....dis 40&10 %
Gem (Coil):
No. 1, Large Japanned....₩ doz $4.00 / No. 2, Medium, Japanned....₩ doz 2.75 / No. 3, Small, Japanned....₩ doz 2.00 } dis 50&10 %
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ₩ doz $1.50 / No. 5, Screen Door size....₩ doz 2.00 / No. 6, Medium....₩ doz 2.75 / No. 7, Large....₩ doz 4.00 } dis 60 %
Victor (Coil)....dis 50&10&10 %
Champion (Coil)....dis 50&10 %
Philadelphia....5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's....No. 1, ₩ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete....₩ doz $2.25, dis 20&10 %
Hercules....dis 50 %
Shaw Door Check and Spring....dis 25 @ 30 @ 35 %

Drawing Knives....dis 75@75&5 %
Douglass & Witherby....dis 70&10 %
Crossman's No. 1....dis 65&5 %
Merrill....dis 65&10 %
Watrous....dis 20 %
L. & I. J. White....dis 20&5 %
Bradley's....dis 35 %
Adjustable Handle....dis 20 %

Drills and Drill Stocks.
Blacksmiths'....each, $2.50, dis 20 %
Blacksmiths' Self-Feeding....each, $7.50, dis 20 %
Breast, P. S. & W....dis 20&10 %
Breast, Hotchkiss....dis 20 %
Breast, Wilson's....dis 25 %
Breast, Millers Falls....each, $3.00 dis 25 %
Breast, Bartholomew's....each, $2.50, dis 25&10 %
Ratchet, Merrill's....dis 20 %
Ratchet, Ingersoll's....dis 25 %
Ratchet, Whitney's....dis 20&10 %
Ratchet, Weston's....dis 20 %
Ratchet, Moore's Triple Action....dis 25@30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00....dis 20&10 %
Wilson's Drill Stocks....dis 10 %
Automatic Boring Tools....each, $2.25, dis 20 %

Drill Chucks.
Morse's Beach Patent....each, $8.00, dis 20 %
Morse's Adjustable....each, $7.00, dis 20 %
Danbury....each, $8.00, dis 30 %

Egg Beaters.
Dover....₩ doz $2.50
Monroe's....dis 35 %
National....₩ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)....₩ gro, $18.00, net
Acme....₩ gro, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.)....₩ gro, $11.50, net

Emery.
Regular numbers....₩ lb 8¢
Flour and F. F....₩ lb 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Brass....dis 60 %

Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 55 %
Wood....dis 25 %

Faucets.
Fenn's....dis 40 %
Bohren's Patent Rubber Ball....dis 25 %
Fenn's Cork Stops....dis 33⅓ %
Star....dis 55&10 %
Frary's Patent Petroleum....dis 40 @ 40&5 %
West's Patent Key....dis 45 %
Anchor Lock....dis 45 %
Metallic Key, Leather Lined....dis 60 %
Cork Lined....dis 70 %
J. Sommer's Best Block Tin Key....dis 40& 10 %
J. Sommer's Cork Lined, 1st quality....dis 50 %
J. Sommer's Diamond Lock....dis 40 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's....₩ doz $36.00—dis 20&10 %
Self-Measuring, Victor....₩ doz $36.00—dis 25&10 %

Felloe Plates....₩ lb 10¢, dis 30 %

Files.
J. & Riley Carr....New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps....dis 10 %
Moss & Gamble....New list, dis 15 %
Files of domestic make....dis 60 %
New Am. File Co., Pat. Tapers....dis 45 %
Stubs....dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls....$3.50 each / Knox, 6-inch Rolls....$4.00 each } dis 35 %
Eagle, 3½-inch Roll....$2.15, dis 35 %
Eagle, 5½-inch Roll....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ₩ doz....dis 30 %
Shepard Hand Fluter, No. 85....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95....₩ doz $8, dis 40 %
Clark's Hand Fluter....₩ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...₩ doz $15.00, dis 30 %
Buffalo....₩ doz $10.00, dis 10 %

Fluting Scissors....dis 45 %

Fly Traps.
Paragon....₩ doz $3, net

Forks.
Hay, Manure and Spading....dis 55 %
Plated, see Spoons.

Freezers.
Buffalo Champion, S. S. & Co....dis 50&10 %

Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20&10 %

Fry Pans.
Burnished list as follows....dis 70@70&5

No.	0	1	2	3	4	5	6	7	8
₩ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

"Acme"....dis 55 %

Gauges.
Marking, Stanley's....dis 55&10 %
Marking, Chapin's....dis 55&10 %
Wire....dis 10&10 %
Wire, Wheeler, Madden & Co....dis 10 %

Gimlets.
Nail and Spike....dis 50&10 %
"Eureka" Gimlets....dis 40&10 %
"Diamond" Gimlets....dis 40&10 %
Double Cut, Shepardson's....dis 45 %
Double Cut, Ives'....dis 45&10 %
Double Cut, Douglass'....dis 40 %
"Bee"....₩ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled....dis 40 %
Family, Howe's "Eureka"....dis 40 %
Family, L. F. & C.'s "Handy"....dis 40 %

Grindstone Fixtures.
Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 33⅓&10 %

Gun Wads.
U. M. C. B. E., 11 up....$1.65
U. M. C. B. E., 9&10....1.90
U. M. C. B. E., 7&8....2.15
U. M. C. P. E., 11 up....2.60
U. M. C. P. E., 9&10....3.40
U. M. C. P. E., 7&8....4.15
Eley's B. E., 11 up....1.75
Eley's P. E., 11 @ 20....2.80

Hack Saws.
Griffin's Hack Saws, complete....dis 40&10 %
Griffin's Hack Saw, Blades only....dis 20&10 %
Star Hack Saws and Blades....dis 25 %

Halters.
Covert's Pat. Rope....dis 50&5 %
Covert's Hemp Horse and Cattle Ties....dis 50 %
Covert's Jute Horse and Cattle Ties....dis 50&10 %
Meneely's Pat. Rope and Web....dis 40&10 %
Meneely's Horse and Cattle Ties....dis 40&10 %

Hammers.
Maydole's....dis 20@25 %
Cheney's, new list, March, 1883....dis 20&10 %
Hartford Hammer Co.'s Nail Hammers..dis 25@25&5 %
Kip's....dis 35 %
C. Hammond & Son....dis 40&5 %
Humason & Beckley....dis 15 %
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75, dis 25&10 %
Nelson Tool Works....dis 40&10 %
Warner & Nobles....dis 10 %
Yerkes & Plumb....dis 40 @ 40&5 %
Wilkinson's Smiths'....11½¢ ₩ lb net
Heavy Hammers and Sledges....dis 60 @ 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz..dis 10 %
Providence Tool Co., Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's....dis 25 %

Handles.—Door or Thumb Latches.

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10 %

Roggin's Latches....₩ doz. 35¢ @ 40¢ net
Bronze Iron Drop Latches....₩ doz. 70¢ @ 80¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88....net
Barn Door....₩ doz. $1.40, dis 10&10 %
Wrought Chest....dis 70 %
Surface Chest....dis 60&10 %
Flush Chest....dis 70 %
Lifting....dis 60&10 %
Saw and Plane....dis 40&10 %
Boynton's Loop Saw Handles....50¢, dis 50 %
Boynton's Centennial Saw Handles....30¢, dis 25 %
Hammer and Hatchet....dis 20 %
Brad Awl....₩ gross $2.00
Hickory Firmer Chisel, assorted....₩ gross $4.50
Hickory Firmer Chisel, large....₩ gross 5.00
Apple Firmer Chisel, assorted....₩ gross 5.00
Apple Firmer Chisel, large....₩ gross 6.00
Socket Firmer Chisel, assorted....₩ gross 3.00
Socket Framing Chisel, assorted....₩ gross 5.00 } dis 40 %
File, assorted....₩ gross 2.75 / Auger, assorted....₩ gross 5.00 / Auger, large....₩ gross 7.00 } dis 25&10 %
Patent Auger, Ives'....dis 25 %
Patent Auger, Douglass'....₩ set $1.25 net
Patent Auger, Swan's....₩ set $1.00 net

Hangers.
Barn Door, old patterns....dis 60&10 %
Barn Door, New England....dis 60&10&10 %
Climax (Anti-Friction)....dis 55 %
Zenith Anti-Friction Wood Track....dis 55 %
Reed's Steel Arm....dis 40 %
Challenge....dis 50 %
"Champion" Medina Mfg Co....$15.00, dis 50&10 %
Sterling Improved (Anti-Friction)....dis 65&10 %
Double Cut, Hartwell's....dis 40&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18....dis 33⅓ %
Cheritree....dis 50 %
Kidder's....dis 50&10 %
U. S....4 in., $12; 5 in., $15, dis 60&10 %
The "Boss"....dis 50&10 %
Terry's Patent....5 in., $12; 3½ in., $10, dis 40 %
Cronk....No. 4, $12; No. 5, $14.40; No. 6, $18, dis 50&5 %
Architect....₩ set $6.00, dis 20 %
Eclipse....dis 20&10
Felix....₩ set $4.50, dis 20 %
Hamilton Wrought....dis 50 %

Harness Snaps.
Anchor (T. & S. Mfg Co.)....dis 65 %
Henshaw's, list of 1½ changed to $14.00....dis 65 %
Judd's, list of 1½ changed to $14.00....dis 65 %
Fitch's (Bristol), list of 1½ changed to $14.00...dis 65 %
Hotchkiss....dis 10 %
Andrews'....dis 50 %
Sargent's Patent Guarded....dis 70&10&10 %
German, old list....dis 75 %
German, Sargent's new list....dis 60&10 %
Covert....dis 50 %
Covert, New Patent, new list....dis 35 %
Covered Spring, new list, Oct., 1882....dis 60&10 %
Meneely's Pat. Safety (Old German list)....dis 50 %
Meneely's Imp. German (Old German list)..dis 60&10 %

Hatchets.
Isaiah Blood....dis 35 @ 40 %
Shingling, Nos. 1 2 3....₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3....₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3....₩ doz 7.50 8.00 8.50
Hunt's....35 %
Shingling, Nos. 1 2 3....₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3....₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3....₩ doz 7.50 8.25 9.00
Hurd's....dis 40&5 @ 45 %
Shingling, Nos. 1 2 3....₩ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3....₩ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3....₩ doz 8.00 8.50 9.00
Yerkes & Plumb....dis 40&5 @ 45 %
Shingling, Nos. 1 2 3....₩ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3....₩ doz 8.25 8.75 9.25
Lathing, Nos. 1 2 3....₩ doz 7.50 8.00 8.50
Underhill Edge Tool Co....dis 40 %
Shingling, Nos. 1 2 3....₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3....₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3....₩ doz 7.50 8.25 9.00
Lathing, Solid Steel....dis 30 %
No. 1, $12. Boston Pattern, $18.
C. Hammond & Son....dis 45 @ 45&5 %
Shingling, Nos. 1 2 3....₩ doz $8.00 $8.50 $9.00
Lathing, Nos. 1 2 3....₩ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3....₩ doz 8.50 9.00 9.50
Broad, Nos. 1 2 3....₩ doz 11.00 13.50 16.00
Simmons....dis 35 @ 40 %
Shingling, Nos. 0 1 2 3..₩ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 0 1 2 3..₩ doz 8.50 9.00 9.50
Lathing, Nos. 0 1 2 3..₩ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4..₩ doz 9.00 10.00 12.00 14.00
Broad, Nos. 5 6 7 8..₩ doz 16.00 18.00 20.00 22.00
Collins....dis 10 %
Shingling, Nos. 1 2 3....₩ doz $5.50 $6.00 $6.50
Claw, Nos. 1 2 3....₩ doz 6.00 6.50 7.00
Lathing, Nos. 1 2 3....₩ doz 5.50 6.00 6.50
Peck's Champion Blade....dis 40&5 @ 40&10 %
Shingling, Nos. 1 2 3....₩ doz $8.00 $8.50 $9.00
Lathing, Nos. 1 2 3....₩ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3....₩ doz 9.00 9.50 10.00
Half, Nos. 1 2 3....₩ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3....₩ doz 10.00 11.00 13.00
Broad, Nos. 4 5 6....₩ doz 14.50 16.50 18.00
Ax Pattern, Nos. 1 2 3....₩ doz 10.00 11.00 12.00

Hay Knives.
"Lightning"....₩ doz $18, dis 10 %
Electric....₩ doz $13 net
Wadsworth's....dis 35 @ 35&5 %
Heath Patent....₩ doz $13.50 net

Hinges.
Gate, Western....₩ doz $4.40, dis 55 %
Gate, N. E....₩ doz $7.00, dis 55 %
Gate, N. E. Reversible....₩ doz $5.20, dis 55 %
Gate, Clark's, Nos. 1 2 3....dis 60&10&2 %
Gate, N. Y. State....₩ doz $5.00, dis 55 %
Gate, Automatic....₩ doz $12.50, dis 50 %
Gate, Common Sense....₩ doz pair $4.50, dis 50 %
Gate, Seymour's....dis 45&10 %
Gate, Shepard's, Nos. 1 and 2....dis 60&10&10 %
Gate, Shepard's, No. 3....dis 60&10 %
Reed's Latch and Hinge....₩ doz sets $12, dis 50 %
Rolled Blind Hinges....dis 50&10 %
Rolled Plate....dis 60&10 %
Rolled Raised....dis 60&10 %
Plate Hinges { 8, 10 & 12 in., ₩ lb....4¼¢
"Providence" { over 12 in., ₩ lb....3¾¢
Screw Hook and { 8, 10, 12 in., ₩ lb....3¾¢
Strap { 14 to 36 in., ₩ lb....2¾¢
Heavy Welded Hook { 8 to 12 in., ₩ lb....3¾¢ / 14 in. & up, ₩ lb....2¾¢
Screw Hook and Eye { ½ in....₩ doz $1.50 / ⅝ in....₩ doz $2.45 / ¾ in....₩ doz $3.80 } dis 10 %
Wrought Strap and T....dis 70 %

Hoes.—Riveted Shank....dis 60 %
Socket....dis 60 %
Planters'....dis 60 %
Scovill Pattern....dis 60 %
Handled Planters'....dis 60 %
Magic....₩ doz $5 net
Grub....₩ doz $10.50 @ $12.00, dis 60 %

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake....dis 15 %
"Moore's" Differential Pulley Block....dis 20 %

Hollow-Ware.
Stove Hollow-Ware, Ground....dis 60 %
Enameled and Tinned Hollow-Ware—
Kettles....dis 60 %
Oval Boilers, Saucepans and Glue Pots....dis 40 %
Gray Enameled Ware....dis 45 %
Rustless Hollow-Ware....dis 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Hooks.
Bird Cage, Sargent's list....dis 60&10 %
Bird Cage, Reading....dis 40&10 %
Cotton....₩ doz $4.00, dis 50 %
Cotton Patented (N. Y. Mallet & Handle W'ks), dis 30 %
Cotton (Humason & Beckley Mfg. Co.)....dis 50 %
Belt....dis 80 %
Bench Hooks....See Bench Stops
Clothes Line, Sargent's list....dis 65&10 %
Clothes Line, Reading list....dis 45&5&10 %
Ceiling, Sargent's list....dis 60&10&10 %
Harness, Reading list....dis 40&10&10 %
Coat and Hat, Sargent's list....dis 60&10&10 %
Coat and Hat, Reading....dis 40&10&10 %
Wire Coat and Hat, Gem....dis 45 %
Wire Coat and Hat, Miles'....dis 70 %
Picture Hooks, Brown's Pat. Solid Brass, $4.00 ₩ gross....dis 25 %
Tassel and Picture (T. & S. Mfg. Co.)....dis 50 %
Wrought Staples and Hooks & Staples. dis 75&10@80 %
Wrought Staples, Stanley's list....dis
Wire Screw Hooks and Screw Eyes....dis 75&10 @ 80 %
Grass and Bush....dis 55 %
Whiffletree—Patent....dis 55 %
Hooks and Eyes—Malleable Iron....dis 60&10 %
Hooks and Eyes—Brass....dis 60&10 %

Horse Nails.

	Nos. 5	6	7	8	9	10	
Ausable....₩ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n..₩ lb		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin..₩ lb		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex....₩ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10&5 %
Putnam....₩ lb	27¢	24¢	22¢	21¢	20¢	19¢	dis 5&7 %
Vulcan....₩ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 15 %
Northwest'n.₩ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&5&5 %
Globe....₩ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5&5 %
A. C....₩ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
C. B.-K....₩ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Champlain...₩ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10&5 %
New Haven..₩ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 40 %
Bridgewater.₩ lb	24¢	21¢	19¢	18¢	17¢	16¢	dis 30 %
Saranac....₩ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 20 %
Champion....₩ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Capewell....₩ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 33⅓&5 %

Horse Shoes.
Burden....₩ keg $3.75
R. I. Horse Shoe Co., Perkins' Imp. Light, Medium and Heavy....₩ keg $3.75
Walker's Forged, Light, Med. or Heavy..₩ keg $3.75
Mule Shoes....₩ keg $4.75

Hose, Rubber.
N. Y. Belting & Packing Co., Standard....dis 60 %

Ice Awls, Chisels, &c.
American Ice Chisel Pol'd....₩ doz $3.00, dis 20 %
National Ice Chisel....₩ doz $6.25, dis 20 %
Novelty Ice Breakers....₩ doz $6.25, dis 20 %
White's Sliding Head Picks....₩ doz $2.50, dis 40 %
Dunlap's Ring Picks....₩ doz $2.00, dis 25 %
Wood Head Picks, Sargent's....₩ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's....₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Malleable..₩ doz $1.25, dis 20 %
Combination Ice Tools....₩ doz $2.00 net

Ice Cream Freezers.
American, Crown and Star....dis 45 %
Gem....dis 55 %

Ice Tongs.
Champion....₩ doz $6.00, dis 25&10 %
Family....₩ doz $2.75, dis 20 %

Kettles.
Brass, 7 to 17 inches inclusive....₩ lb 28¢, dis 15 %
Brass larger than 17 inches....₩ lb 32¢, dis 15 %
Enameled and Tea Kettles....See Hollow-Ware

Knives.
Ames' Butcher Knives....dis 25 %
Nichols' Butcher Knives....dis 40&10 %
Ames' Shoe Knives....dis 15 %
Ames' Bread Knives....₩ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives....dis 20 %
Hay and Straw....See Hay Knives
Table and Pocket....See Cutlery

Knobs.
Carrriage, Japanned....₩ gross 80¢, dis 60&10 %
Base, Rubber Tip....dis 70&10&5 %
Hemacite Door Knobs, new list....dis 35&5 %
Door Mineral / Door Por. Jap'd / Door Por. Plated / Door Por. } Same discounts as Door Locks.
Furniture Plain....75¢ gross net, dis 10 %
Furniture, Wood Screws....dis 25&10 %
Picture, Judd's....dis 60&10&10 %
Picture, Sargent's....dis 60&10 %
Hemacite, Picture....dis 35 %
Shutter, Porcelain....dis 60&10 %

Ladles.
Melting, Sargent's....dis 50&10 %
Melting, Reading....dis 30&10 %
Melting, Monroe's Patent....₩ doz $4.00, dis 40 %
Melting, P. S. & W....dis 30&10 %
Eberhard Mfg. Co....dis 33⅓ %

Lanterns.
Tubular, Standard No. 0, ₩ doz....$7.00 @ 7.25
Tubular, Standard No. 1, ₩ doz....8.75 @ 9.00
Tubular, Lift Wire, No. 0, ₩ doz....8.50 @ 9.00
Tubular, Lift Wire, No. 1, ₩ doz....10.50
Guards for Tubulars, add ₩ doz....25
Tipping Tubular, ₩ doz....8.00
Police, Small, $6.00; Med., $7.25; Large, $9.75...dis 10 %
Porter's Tin R. R., $10....dis 20 %
Owl....$9, dis 20 %

Lemon Squeezers.
Porcelain Lined....₩ doz. $6.00, dis 35&5 %
Wood....₩ doz. $3.00, dis 35 %
Eureka, Tinned....₩ doz. $8.00, dis 10 %
Dunlap's Improved....₩ doz. $3.75, dis 20 %
Sammis'....No. 1, $5; 2, $9; 12, $18 ₩ doz., dis 20&10 %
Townsend's Patent....$6.00 ₩ doz., dis 33⅓ %
Jennings' "Star"....$3.00 ₩ doz. net
The "Boss"....₩ doz. $4.00, dis 10&10 %
Dean's Nos. 1, ₩ doz. $15.00; 2, $8.00; 3, $5.50....dis 55 %
Little Giant....dis 50 %

Lines.
Linen Fish....dis 25&10 %
Cotton Chalk....dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50....Net
Masons' Colored Cotton....dis 45 %
Wire Clothes, Galvanized....each, 25¢@40¢ net

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Escutcheons, &c....dis 60&2 @ — %
Reading Hardware Co. (rev. list Jan. 2, '84)..dis 60&10 %
Plate....dis 33⅓&2 %
F. Many's "Extension Cylinder"....$10.50 ₩ doz net
Barnes Mfg. Co....dis 40 %
Yale Flat Key....dis 40 %
Dietz Flat Key....dis 30 %
Stoddard....dis 30 %
Langstroth & Crane's:
Round Key Latches....dis 40&10 %
Flat Key Latches....dis 33⅓&10 %
Cabinet, Eagle / Cabinet, Gaylord / Cabinet, P. & F. Corbin } Changes made in list price of some numbers March 10, 1884, dis 45&2 % cash.
Cabinet, A. E. Deitz....dis 30@40 %
Cabinet, Stoddard Lock Co....dis 30 %
A. E. Deitz, Flat Key Drawer....dis 30@40 %
Yale new list....dis 40 %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American"....dis 40&10 %
Eagle Trunk....dis 25&2

PADLOCKS.
Russell & Erwin / Mallory, Wheeler & Co. / Nimick & Brittan Mfg. Co. / Wm. Wilcox & Co. / Norwich Lock Co. } dis 45&2 % @ —
Yale Lock Mfg. Co.'s....dis 40 %
Eagle....dis 25&2 %
Romer's, Nos. 0 to 91....dis 40 %
Romer's, Nos. 200 to 505....dis 25 %
A. E. Dietz....dis 35 %
"Star"....dis 15 %
"Horse Shoe," ₩ doz., $9....dis 40 %
Fraim & Bro. List of 1883-84....dis 55&5 %
Barnes Mfg. Co....dis 40 %
Nock's....dis 30 %
Brown's Patent....dis 25 %
Scandinavian....dis 80 %

Lustre.
Four-ounce bottles....₩ doz, $1.75; ₩ gro. $17.00 net

Mallets.
Hickory....dis 10&10&5 %
Lignumvitæ....dis 10&10&5 %
Penfield Block Co., Lignumvitæ and Hickory..dis 30 %

Meat Cutters.
Dixon's (P. S. W&.) Nos 1 2 3 4
₩ doz..$14.00 17.00 19.00 30.00—dis 40 %
Miles' Challenge....Nos. 1 2 3
₩ doz..$22.00 30.00 40.00—dis 40 %
Woodruff's (P. S. & W.)....Nos. 100 150
₩ doz. $15.00 18.00—dis 45 %
Hales'....Nos. 11 12 13
₩ doz...$27.00 33.00 50.00—dis 60&10&2 %
Draw Cut..Nos. 5 2 6 8 10
Each..$50.00 75.00 80.00 225.00 400.00—dis 20 %
American....dis 35 %
Nos. 1 2 3 4 8
Each....$5.00 7.00 10.00 25.00 50.00 60.00
Enterprise....dis 25 %
Nos. 10 12 22 2
Each....$3.00 2.50 4.00 6.00 10.00
Kieser's No. 55....$40 ₩ doz, dis 40 %
Kieser's Gem....$25 ₩ doz, dis 40 %
Kieser's Monarch....$45 ₩ doz, dis 40 %
Kieser's Butcher....$40 each, dis 20 %
Silver & Deming....dis 25 %
Pennsylvania....dis 40&10 %
Nos. 1 2 3 00
₩ doz....$24.00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 %

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18....Net
Lothrop's....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40 %
Cowles Hdw. Co....dis 60 %

Molasses Gates.
Stebbins' Patterns....dis 70&10&2 %
Stebbins' Genuine....dis 67½&10 %
Stebbins' Tinned Ends....dis 40&10 %
Chase's Hard Metal....dis 50&10 %
Bush's....dis 20 %
Lincoln's Pattern....dis 70&10 %
Weed's....dis 20&10 %
Boss Nos. 1 2 3 4
$7.00 8.00 9.00 10.00..₩ doz, dis 60&10&10 %

Nails....See Trade Report
Wire Nails....dis 40&5 @ 45 %

Nail Puller.
Curtiss Hammer....₩ doz $9.00 net
Giant, No. 1....₩ doz $30.00 net

Nuts and Washers.
In lots less than 100 lb, ₩ lb add ½¢ to list; 1 lb boxes, 1¢ to list.
Square Nuts....9¢ off list
Hexagon....9½¢ off list
Washers....8½¢@9¢ off list

Nut Crackers.
Table (Humason & Beckley Mfg. Co.)....dis 33⅓ %
Blake's Pattern....₩ doz $2.00, dis 5 %
Turner & Seymour Mfg. Co....dis 50 %

Oakum.—Dis on 100 bales and over, ½ % ₩ lb.
Best....₩ lb 9 ¢
U. S. Navy....₩ lb 8 ¢
Navy....₩ lb 6½¢

Oilers.
Zinc and Tin....dis 60&10 %
Brass and Copper....dis 50 %
Malleable (Hammer's), No 1, $3.25; No. 2, $3.60; No. 3, $4.00 ₩ doz....Net
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass....dis 50 %
Olmstead's Tin and Zinc....dis 60
Olmstead's Brass and Copper....dis 50 %
Broughton's Zinc....dis 60 %
Broughton's Brass....dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co.....dis 50&10 %

Peach Parers.
Rotary Knife.....₱ doz $15, dis 10 %
Diamond State.....₱ doz $15, dis 10 %

Pencils.
Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₱ gro $5.25 net
Dixon's Lead.....₱ gro $4.50 net
Dixon's Lumber.....₱ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12..dis 60&5 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13..dis 60&5 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10 %
Brass Head, T. & S. Mfg. Co.....dis 50 %
Porcelain Head, Sargent's list.....dis 50&10 %
Porcelain Head, Judd's list.....dis 40 %
Porcelain Head, T. & S. Mfg. Co.....dis 40 %
Niles' Patent.....dis 40 %

Pinking Irons......₱ doz 65¢ net

Planes and Plane Irons.
Bench, First Quality.....dis 20&10&2 %
Bench, Second Quality.....dis 15&10&2 %
Molding.....dis 20&10 %
Bailey's (Stanley R. & L. Co.).....dis 20&10 %
The Stanley (S. R. & L. Co.).....dis 20&10 %
Bailey's "Victor".....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....$5.00 to £
Plane Irons, Auburn Tool Co.....dis 20&10 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron".....dis 33⅓ %
L. & I. J. White.....dis 25 %
Plane Irons, Ohio Tool Co.....dis 20&10 %
Plane Irons, Sandusky Tool Co.....dis 20&10 %

Pliers and Nippers.
Button's Patent.....dis 33⅓ @ 30&10 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₱ doz.....dis 20&10 %
Humason & Beckley Mfg. Co.....dis 30&10 %
Gas Pliers.....dis 55 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers.....add 6 % dis 10 %

Plumbs and Levels.
Disston's.....dis 45&10 %
Stanley R. & L. Co.'s Pat. Adjustable.....dis 65&10&10 %
Stanley R. & L. Co.' Non-Adjustable.....dis 65&10&10 %
Chapin's Patent Adjustable.....dis 65&10&10 %
Chapin's Non-Adjustable.....dis 65&10&10 %
Standard Rule Co.'s New Adjustable.....dis 65&10&10 %
Standard Rule Co.'s Non-Adjustable.....dis 65&10&10 %
Johnson's Patent Adjustable.....dis 65&10&10 %
Pocket Levels.....dis 65&10&10 %
Davis' Inclinometers.....dis 20 %

Post Hole and Tree Augers.
Samson Post Hole Digger.....₱ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers.....₱ doz $36.00, dis 20 %
Eureka Diggers.....₱ doz $27
Leed's.....each $2.50
Vaughan's Hollow Tube Post Hole—
6 in., $23.60; 7, 8 and 9 in., $35.00 ₱ doz., dis 20&10 %
Kohler's Little Giant.....₱ doz $27

Potato Parers.
White Mountain.....₱ doz $5.50
Antrim Combination.....₱ doz $9.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ₱ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₱ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruner.....dis 33⅓ %
Pruning Shears.....₱ doz $4.00 @ $4.50
Henry's Pruning Shears.....₱ doz $5.50 @ $5.75 net
Wheeler, M. & Co.'s Combination...₱ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₱ doz $8.50, dis 30 %

Pulleys.
Hot House, Awning, &c.....dis 65&10 %
Japanned Screw.....dis 65&10 %
Brass Screw.....dis 70&10 %
Japanned Side.....dis 65&10 %
Japanned Clothes Line.....dis 60&10 %
Hay Fork, Solid Eye...$4.50; Swivel, $5.00, dis 50&10 %
Hay Fork, "Anti Friction".....$6.75, dis 10&10 %
Hay Fork, "₱" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.
Cistern.....dis 60 %
Pitcher Spout.....dis 70 %

Punches.
Saddlers' or Drive....₱ doz $2.00; 2.25; 2.50...dis 55 %
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring.....₱ doz $6.00, dis 55 %
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₱ doz $1.44, dis 50 %

Rail.
Sliding Door, Wrought Brass....₱ ℔ 35¢, dis 20 %
Sliding Door, Bronzed Wrt. Iron ₱ foot 12½, dis 35 %
Sliding Door Iron, Painted.....₱ foot 4¢, dis 20&10 %
Barn Door, Light....Inch. ½ ⅝
Per 100 feet..... $2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet..... $2.15 2.70 3.25 net
Terry's Wrought Iron, 5¢ ₱ foot..... net

Rakes.
Cast Steel.....dis 60 %
Malleable.....dis 60 %

Razors.
J. R. Torrey Razor Co.....dis 20 %
Wostenholme & Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 %
Imitation Emerson.....₱ doz $2.00, dis 20&10&10 %
Torrey's.....dis 20 %

Rivets.
Black Iron and Tinned.....dis 40 @ — %
Iron in bulk.....dis 40 @ — %
Iron Carriage Rivets.....dis 40 @ — %
Tinned Iron Rivets and Burrs.....dis 40 @ — %
Copper Rivets and Burrs.....dis 50 @ 50&10 %
Nos. 7 8 9 10 11 12 14 15
₱ ℔.49¢ 50¢ 52¢ 54¢ 56¢ 58¢ 60¢ 65¢ 70¢

Rivet Sets......dis 50 %
Rods.—Stair, Brass.....dis 25 %
Stair Black Walnut.....60¢ ₱ doz., dis 10 %
Rollers.—Barn Door, Sargent's list..dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Rope.—Mnf'rs list, Oct. 15, 1884.....dis 1¢ ₱ ℔
Manilla.....¾ inch and larger ₱ ℔ 15½¢
Manilla.....⅝ inch ₱ ℔ 16 ¢
Manilla.....¼ and 5-16 inch ₱ ℔ 16½¢
Manilla Tarred Rope.....₱ ℔ 15 ¢
Manila, Hay Rope.....₱ ℔ 15½¢
Sisal.....¾ inch and larger ₱ ℔ 9½¢
Sisal.....⅝ inch ₱ ℔ 10 ¢
Sisal.....¼ and 5-16 inch ₱ ℔ 10½¢
Sisal, Hay Rope.....₱ ℔ 9½¢

Rules.
Boxwood.....dis 75&10&10 %
Ivory.....dis 55 %

Sad Irons.
Solid Rox.....dis 50 %
Parallel, Fisher & Morris Double Screw.....dis 15&10 %
Parallel, Stephens'.....dis 25 %
Parallel, Parker's.....dis 20 %
Parallel, Wilson's.....dis 50 %
Parallel, Howard's.....dis 40 %
Parallel, Bonney's.....dis 40 %
Parallel, Merrill's.....dis 40 %
Parallel, Sargent's.....dis 15&2 %
Parallel, Backus and Union.....dis 60&10 %
Parallel, Double Screw Leg.....dis 15&10 %
Parallel, Preutiss.....dis 25 %
Parallel, Simpson's Adjustable.....dis 40 %
Saw Filers, Bonney's, Nos. 2 & 3...₱ doz $15.00, dis 40 %
Saw Filers, Stearn's.....dis 20&10 %
Saw Filers, Hopkins'.....₱ doz $17.50, dis 10 %
Saw Filers, Reading.....dis 10&10 %
Saw Filers, Wentworth.....dis 20&10 %
Cowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 25 %

From 4 to 10.....₱ 100 ℔ $2.70 @ $2.75
Self Heating.....₱ doz. $9.00 net
Self-Heating, Tailors'.....₱ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Double Pointed.....dis 35 %
Mrs. Pott's Irons, Square Back.....dis 35 %
Enterprise Star Irons, new list, July 20, 1882.....dis 35 %
Combined Fluter and Sad Iron...₱ doz. $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint, 00 to 1½.....$4.50 ₱ ream
Baeder & Adamson's Flint, 2, 2½ & 3.....5.00 ₱ ream
Baeder & Adamson's Flint, assorted...4.75 ₱ ream
Baeder & Adamson's Star.....3.75 ₱ ream
Baeder & Adamson's Emery.....₱ ream 6.50 @ 11.50
Bartles Best Flint, Nos. 00 to 1½.....₱ ream $4.50
Bartles Best Flint, assorted.....₱ ream 4.50
Bartles Best Flint, Nos. 2 to 3.....₱ ream 5.00
Bartles Best Flint, No. 3½.....₱ ream 5.50
Columbia Flint, all Nos.....₱ ream 4.00
Madison Mills Flint, all Nos.....₱ ream 3.50
Bartles Emery Paper.....₱ ream $6.50 @ 11.00
Bartles Emery Cloth.....₱ ream 18.00@ 26.00
Crocus Cloth.....₱ ream 18.00@.....
} dis 40 & dis 20
New England, same list as B. & A. Flint.....dis 30&10 %
Gage's.....dis 30&10 %

Sash Cord.
Common.....₱ ℔, 12½¢ @ 13¢ net
Patent.....₱ ℔, 15¢ @ 16¢ net
White Cotton Braided.....32½¢ @ 34¢ ₱ ℔ net
Common Russia Sash.....₱ ℔ 13¢
Patent " " " 15¢
Cable Laid Italian " " " 20¢
India Cable Laid " " " 14¢
Silver Lake, A Quality, White.....50¢, dis 10&10 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10 %
Silver Lake, B Quality, White.....50¢, dis 10&10&10 %
Silver Lake, B Quality, Drab.....55¢, dis 10&10&10 %
Silver Lake, C Quality, White (only).....34¢ net.
Spring Lake.....50 @ 55¢, dis 10&10&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₱ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris.....dis 50 @ 50&10 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25&2½ %
Hammond's Window Springs.....dis 25 %
Common Sense," Japanned, Coppered and Bronzed.....₱ gross $5.00 net
"Common Sense," Nickel Plated....₱ gross $12.00 net
"Universal".....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 50&10@60 %
Corbin's Daisy.....dis 50&10@60 %
Payson's Perfect.....dis 50&10&5 %
Hugunin's "New" and "Improved Screw" Balances:
Malleable Iron, February, 1884, list.....dis 33⅓ %
Gray Iron, February, 1884, list.....dis 33⅓&15 %
Hugunin's Sash Locks, May, 1884, list.....dis 33⅓ %
Stoddard "Practical".....dis 10 %

Sash Weights.
Solid Eyes, in ton lots.....₱ ton, $19

Sausage Stuffers or Fillers.
Miles "Challenge".....₱ doz. $20, dis 40 %
Perry.....₱ doz. No. 15: No. 0, $21, dis 25&10 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 25 %
Silver's.....dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut.....dis 45&10 %
Disston's Hand, Panel, Rip, &c.....dis 20&10 %
Atkins' Silver Steel Circular.....dis 40 %
Atkins' Selected Steel Circular.....dis 50 %
Atkins' Concaved Tooth Dexter X Cuts.....₱ foot 55 ¢
Atkins' C. S. X Cuts, Regular.....₱ foot 34 ¢
Atkins' Hollow Back X Cuts.....₱ foot 29 ¢
Beeler, Madden & Clemson Mfg. Co.'s Hand..dis 30 %
W. M. & C. Champion X Cuts, Regular.....₱ foot 27¢
W. M. & C. X Cuts, Thin Back.....₱ foot 30¢
Livingston's Butcher and Kitchen.....dis 20 %
Livingston's Framed Wood—
Nos..... 101 102 103 104 105
Per doz..... $10.00 8.50 10.00 7.50 6.20 net
Simond's Circular.....dis 35 %
Simond's Crescent-Ground Cross Cuts, patent December 26, 1882.....dis 25 %
Peace Circular and Mill.....dis 45&10 %
Peace Hand, Panel and Rip.....dis 20&10 %
Peace Cross Cuts, Standard.....₱ foot 26¢
Peace Cross Cuts, Thin Back.....₱ foot 20¢
Peace Band Saws, all widths.....dis 20&10 %
Richardson's Circular.....dis 45 %
Richardson's Mill.....dis 45 %
Richardson's Cross-Cuts, No. 1, 31¢; No. 2, 28¢; No. 3, 26¢.
Richardson's Hand Panel, Butcher and Web Saws.....dis 25&5 %
Barry's Circular.....dis 45 %

Saw Frames.
White, Vermont.....₱ doz $1.50, dis 25&10 %
Red, Polished and Varnished.....₱ doz $1.50, dis 10 %
Saw Rods.....$10 list dis 10&10 %

Saw Sets.
Boynton's Patent X Cut, ₱ doz $12.00; Hand Saw, ₱ doz $10.00.....dis 25 %
Stillman's Genuine....₱ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imitation..₱ doz $3.25 and $5.25, dis 40&5 %
Common Lever.....₱ doz $2.00, dis 40&5 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....dis 20&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Alsen's Genuine.....$13.00, dis 50&10 %
Alsen's Imitation.....$8.00, dis 55 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20&10 %
Morrill's..No. 1, $15.00; No. 5, $52.00.....dis 40&10 %
Crolssant (Keller)...No. 1, $15.00; No. 2, $24.00, dis 40 %

Scales.
Hatch, Counter, No. 171. ....₱ doz $42.00, dis 40&10 %
Hatch, Tea, No. 161.....₱ doz $15.00, dis 40&10 %
Union Platform.....$6.00, dis 55 %
Chatillon's Grocers.....dis 40 %
Chatillon's Eureka.....dis 25 %
Chatillon's Family Favorite.....dis 30 %
Family Universal, ₱ doz, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's.....dis 30 %
Scale Beams, List of January 12, 1882.....dis 60 %
Scale Beams, Custer.....dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 20&10 %
Box, 1 Handle.....₱ doz $4.00, dis 10 %
Box, 2 Handle.....₱ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10 %
Ship, Common.....₱ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame.....dis 33⅓ %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles.....dis 60&10 %
Stanley R. & L. Co.'s Black Handles.....dis 50&10 %
Sargent & Co.'s Nos. 1 & 20, Forged Blade.dis 60&5&10 %
Sargent & Co.'s Nos. 20 & 30, Cast Steel.....dis 55&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 60&10 %
Sets interchangeable.....₱ doz $18.00, dis 25 %
Champion.....dis 25 %
Clark's Patent.....dis 20&10 %
Crawford's Adjustable.....dis 30 %

Screws
Flat Head Iron.....dis 75&5 %
Round Head Iron.....dis 70&5 %
Flat Head Brass.....dis 75&5 %
Round Head Brass.....dis 65&5 %
Brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 60&10 %
Lag or Coach.....dis 75&5 %
Coach, Patent Gimlet Point.....dis 75 %
Red.....dis 33⅓ %
Machine, Flat Head, Iron.....dis 55 %
Machine, Round Head, Iron.....dis 50 %
Beach, Iron.....dis 55&10 %
Bench, Wood, Beech.....₱ doz $3.00, dis 10 %
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 %
Hand Rail, Sargent's.....dis 60&2&10 %
Hand Rail, Humason, Beckley & Co.'s.....dis 70 %
Hand Rail, Am. Screw Co.....dis 70 %

Scroll Saws.
Lester, $10.00.....dis 25 %
Rogers, $3.50.....dis 25 %

Scythes......dis 25 %

Shears and Scissors.
American (Cast) Iron.....dis 75 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₱ doz $3.75
Tinners'.....add 6 % dis 10 %
Seymour's, List, Dec., 1881.....dis 60&10 %
Heinsch's, List, Dec., 1881.....dis 60&10 %
Heinsch's Tailor's Shears.....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers.....dis 80 %
Cast Steel Trimmers.....dis 80 %
Wiss, J., & Sons' list, Dec., 1881.....dis 60&10 %
Wiss, J., & Sons' Tailors' Shears.....dis 50 %

Sheaves.
Sliding Door, M. W. & Co., list.....dis 50&10&2 %
Sliding Door, R. & E., list.....dis 60&10&2 %
Sliding Door, Patent Roller.....dis 60&10&2 %
Sliding Door, Patent Roller, Hatfield's...dis 60&10&2 %
Sliding Door, Russell's Anti-Friction.....dis 60&10&2 %
Sliding Door, Moore's Anti-Friction.....dis 60 %
Sliding Shutter, R. & E. list.....dis 50&10&2 %
Sliding Shutter, Sargent's list.....dis 60&10 %
Sliding Shutter, Reading list.....dis 60&10 %
Moore's Anti-Friction (Hanging).....New list, dis 25 %

Ship Tools.
L. & I. J. White.....dis 20&5 %

Shovels and Spades.
Ames' Shovels, Spades and Scoops.....dis 17½ %
Griffiths'.....dis 50&10 %
Old Colony.....dis 15 %
Groom Shovel Co.....dis 20 %
Hussey, Binns & Co.....dis 20 %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882.....dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list.....dis 30 %
R. T. Pettebone, Pat. Scoops, new list.....dis 30 %
Remington's (Lowman's Patent).....dis 30 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's, Steel.....dis 60 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 60&10&2 %
Iron and Brass Head, P. S. & W.....dis 50&5&10 %
Polished Steel, new list.....dis 50&10&2 %

Sieves.
Buffalo Metallic, S. S. & Co.....dis 50&25 %

Slates.
Square Frames, by case.....dis 45 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.), new list.....dis 30&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₱ doz $10.00, dis 50 %
Stearns'.....₱ doz $9.00, dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₱ doz, dis 55&10 %
Douglass'.....₱ doz $9.00, dis 20 %

Spoons.
Basting.....dis 70&10 %
Solid Table and Tea.....dis 70&10 %
Britannia.....dis 60&10 %
Meriden Brit. Co., Rogers.....dis 50&5 %
Wm. Rogers Mfg. Co.....dis 50&5&5 %
Holmes, Booth & Haydens.....dis 50&10 %
Holmes & Edwards Silver Co.....dis 50&10&5 %
German Silver.....dis 40&10&5&50 %
Cast Steel, Silver Plated.....dis 40 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30.....dis 50 @ 50&10 %
Tin (P. S. & W.), Teas.....$1.25 ₱ gro net
Tin (P. S. & W.), Tables.....$2.00 ₱ gro net
Tin (Cowles Hdw. Co).....dis 10 %
Tin (Cowles Hdw. Co.), case lots.....dis 20 %

Squares.
Steel and Iron.....
Nickel Plated.....
} dis 60 @ — %
Try Square and T Bevels.....dis 55&10 %
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Miter.....dis 20&10 %

Stocks and Dies......dis 5&10@— %

"Lightning" Screw Plate.....dis 10 %

Stone.
Hindostan No. 1, 6¢; Ax, 8¢; Slips, 10¢.....dis 40 %
Sand Stone.....₱ ℔, 5¢, dis 33⅓&10 %
Washita Stone, Extra.....₱ ℔, 16½¢
Washita Stone.....No. 1, ₱ ℔, 14¢
Washita Stone.....No. 2 ₱ ℔, 10¢
Washita Stone Slips.....No. 1, ₱ ℔, 27¢
Arkansas Stone, No. 1, 4 to 6 in.....₱ ℔, $1.35, dis 10 %
Arkansas Stone, No. 1, 6 to 9 in.....₱ ℔, $2.00, dis 10 %
Turkey Oil Stone (Chase)....4 to 8 in. ₱ ℔, 60¢, dis 10 %
Turkey Slips (Chase).....$1.75 ₱ ℔, dis 10 %
Lake Superior (Chase).....₱ ℔, 16¢, dis 10 %
Lake Superior Slips (Chase).....₱ ℔, 30¢, dis 10 %
Grindstones, Family, Loring's.....dis 10 %

Stove Boards.
Buffalo Zinc, S. S. & Co.....dis 50 %

Stove Polish.
Joseph Dixon's.....₱ gro $6.00, dis 10 %
Gem.....₱ gro $4.50, dis 10 %
Gold Medal.....₱ gro $6.00, dis 25 %
"Mirror".....₱ gro $6.00, dis — %
Lustro.....₱ gro $4.75 net
Ruby.....₱ gro $3.75 net
Rising Sun.....₱ gro $5.75 net
Dixon's Plumbago.....₱ ℔ 8¢ net
Boynton's Noon Day, ₱ gro. No. 1, large, $5.50; No. 2 small, $3. No. 3, medium, $4.

Tacks, Brads, &c.
New List, Sept. 1, 1882
Tinned Swedes Tacks.....dis 30 %
Tinned American Tacks.....dis 30 %
Swedes Tacks, all kinds.....dis 30 %
American Cut Tacks.....dis 30 %
Copper Tacks and Nails.....dis 30 %
Swedes Hungarian Nails.....dis 35 %
Gimp and Lace Tacks.....dis 30 %
Gimp and Lace Tacks, Tinned.....dis 30 %
Finishing Nails.....dis 25 %
Common and Patent Brads.....dis 20 %
Basket Nails.....dis 20 %
Brush Tacks.....dis 20 %
Leathered Carpet Tacks.....dis 20 %
Cigar Box Nails.....dis 20 %
Chair Nails.....dis 20 %
Double-pointed Tacks.....dis 75&10 %
Extra 10&2½ on all.

Tap Borers.
Common and Ring.....dis 20&10 %
Ives' Tap Borers.....Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers.....Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co.....dis 20&10 %
Clark's.....dis 20&10 %

Tapes, Measuring.
American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 %

Thermometers.
Tin Case.....dis 80 %

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 20 & 2 %
Tools (P. S. & W.).....add 6 & 5 % dis 10 %

Tinware.
Stamped, S. S. & Co.....Net prices
Pieced, S. S. & Co.....dis 60
Japanned, S. S. & Co.....dis 25&10 %

Transom Lifters.
Wollensak's Patent.....dis 35 %
Reiher, Imp. Lifter, list, Oct., 1883.....dis 35&5 %
Excelsior.....dis 50&10&2 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 %
Wood Bottom.....₱ doz $10.00, dis 30&10 %
All Iron.....₱ doz $4.50 net
Nashua Lock Co.'s.....₱ doz $18.00 dis 50&55 %
Wilson's.....dis 50 %
Clipper (Sargent & Co.).....₱ doz $24, dis 50&10 %
Acme.....₱ doz $20.00, dis 40 %

Traps.
Game, Newhouse.....dis 35 %
Game, Oneida Pattern.....dis 60&10 %
Game, Blake's Patent.....dis 40&10 %
Mouse, Wood, Choker.....dis 40&10 %
Mouse, Round Wire.....₱ doz holes, 15¢
Mouse Cage, Wire.....₱ doz $2.50, dis 10 %
Mouse Catch-'em-alive.....₱ doz $2.50, dis 15 %
Mouse, "Bonanza".....₱ gross $10 net
Mouse, Delusion.....₱ gross $18.00, dis 20 %
Rat, "Decoy".....₱ doz $10.00, dis 10 %

Trowels.
Tiltrops' Brick and Plastering.....dis 20&10 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 50 %

Triers.
Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882.....dis 40 %

Twine.
No. 12, Flax Twine, ¼ and ⅛ ℔ Balls....18¢ 20¢
No. 18, " " ¼ and ⅛ " ....17¢ 18¢
No. 30, " " ¼ and ⅛ " ....17¢ 18¢
No. 284, Mattrass, ¼ and ⅛ " ....
Chalk Line, Cotton, ⅛ ℔ Balls.....39¢
Mason Line, Linen, ⅛ " .....28¢
2 Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....15¢
3 Ply " 1 ℔ Balls.....14¢
3 Ply " 1½ ℔ Balls.....13¢
Cotton Wrapping, 5 Balls to ℔.....14¢ @ 20¢
2, 3, 4, and 5 Ply Jute, ½ ℔ Balls.....11¢
Cotton Mops—d, 9, 12 and 15 ℔ to doz.....17¢

Vises.
Solid Rox.....dis 50 %
Parallel, Fisher & Morris Double Screw.....dis 15&10 %
Parallel, Stephens'.....dis 25 %
Parallel, Parker's.....dis 20 %
Parallel, Wilson's.....dis 50 %
Parallel, Howard's.....dis 40 %
Parallel, Bonney's.....dis 40 %
Parallel, Merrill's.....dis 40 %
Parallel, Sargent's.....dis 15&2 %
Parallel, Backus and Union.....dis 60&10 %
Parallel, Double Screw Leg.....dis 15&10 %

Washer Cutters.
Smith's Patent.....₱ doz $12.00, dis 20&10&10 %
Johnson's.....₱ doz $11.00, dis 33⅓ %
Penny's.....₱ doz Pol. $11; Jap'd, $10...dis 55 %
Appleton's.....₱ doz $10.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.—See Nuts and Washers.

Well Wheels......dis 60& 10 %

Wire.
Brass and Copper new list, Jan. 18, 1884.....dis 20 %
Market, Bright and Annealed, Nos. 0 to 18.....dis 70 %
Market, Coppered.....dis 65 %
Market, Galvanized.....dis 60 %
Market, Tinned, Tinned list.....dis 60 %
Stone, Bright and Annealed Nos. 19 to 20.....dis 70 %
Stone, Bright and Annealed Nos. 27 to 30.....dis 75 %
Stone, Galvanized, Nos. 19 to 30.....dis 55 %
Stone, Tinned, Tinned list.....dis 60 %
Tinned Broom Wire.....dis 45 %
Cast Steel Wire.....dis 55 %
Annealed Fence, Nos. 8 & 9.....dis 70 %
Annealed Grape, Nos. 10 to 14.....dis 70 %
Fence Staples.....₱ ℔ 5 ¢
Fence Staples, Galvanized.....₱ ℔ 6 ¢
Stubs' Steel Wire.....$6.00 to £, dis 30 %
Barb Fence.....See Trade Report
Wire Nails.....dis 65 %
Steel Music Wire, Nos. 7 to 30.....55¢ ₱ ℔
Picture Wire.....dis 55 %
Clothes Line Wire, Galvanized....₱ coil 55¢ @ 40¢ net
Wire Cloth, green, drab and black, ₱ 100 sq. ft. .....$2.00 @ 2.25 net

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 33⅓ %
Baxter's Diagonal.....dis 35&10 %
Coes' Genuine.....cash in 10 days, dis 60&3 %
Coes' "Mechanics".....dis 60&10&3 %
Coes' Pattern, Malleable.....dis 70&15 %
Coes' Pattern, Wrought.....dis 75 %
Girard Standard.....dis 65&10 %
Girard Agricultural.....dis 75 %
Bemis & Call's Patent Combination.....dis 30 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Pattern.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40 %
Alsen's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₱ doz $4.00, dis 40 %
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 25&25&10 %
"Always Ready".....dis 25 %
Alligator.....dis 40&10 %
Donohue's Engineer.....dis 25 %

Wringers. Per doz.
Novelty, for Common Tubs, No. 2, 10 inch....$30.00
Novelty, for Common Tubs, No. 3, 11 inch.....34.50
Excelsior, for Stationary Tubs, No. E, 10-inch 30.00
Excelsior, for Stationary Tubs, No. F, 11-inch 43.50
Excelsior, with Folding Bench, No. A, 10 inch 48.00
Excelsior, with Folding Bench, No. B, 11 inch 52.50
Universal, No. 2½.....30.00
Universal, No. 3.....33.00
Universal, No. 1½.....34.50
Universal, No. 1¾.....39.00
Universal, No. 1.....57.00
Universal, for Set Tubs, A 2½.....39.00
Universal, for Set Tubs, B 1¾.....48.00
Universal, for Set Tubs, C 1.....66.00
Adams & Co. No. 8.....30.00
Peerless No. 2½.....30.00
Peerless No. 3½.....30.00
No. 99 Improved 2½.....34.50
"Metropolitan," No. 2.....30.00
"Metropolitan," No. 2½.....33.00
"Metropolitan," No. 3½.....30.00

Wrought Staples, Hooks, &c.—See Hooks.

WHOLESALE METAL PRICES, November 26, 1884.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ℔ ℔; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ℔ ℔. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ℔ ℔. Railroad Bars weighing more than 25 ℔ ℔ yard, 7-10¢ of 1¢ ℔ ℔.

Standard American Pig Iron.

Foundry No. 1 X	℔ ton	$19.00 @ 20.00
Foundry No. 2 X	℔ ton	17.50 @ 19.00
Gray Forge	℔ ton	16.00 @ 17.50

No. 1 Scotch Pig Iron.

Carnbroe	℔ ton	20.50 @ 21.00
Coltness	℔ ton	22.00 @ 22.50
Shotts	℔ ton	21.50 @ 22.00
Glengarnock	℔ ton	..... @ 20.50
Gartsherrie	℔ ton	21.00 @ 22.00
Langloan	℔ ton	21.50 @ 22.00
Summerlee	℔ ton	..... @ 21.00
Dalmellington	℔ ton	..... @ 20.00
Eglinton	℔ ton	19.25 @ 19.50
Clyde	℔ ton	..... @ 20.00

Rails.

Steel, at Eastern mills	℔ ton	27.00 @ 29.00
Old Rails, Ts	℔ ton	16.50 @ 17.00

Scrap.

Wrought, ℔ ton, from yard ..... 18.50 @ 19.00

Bar Iron from Store.

Common Iron:		
¾ to 1 in. round and square	℔ ℔	1.7 @ 2¢
1 to 6 in. x ¾ to 1 in	℔ ℔	1.7 @ 2¢
Refined Iron:		
¾ to 2 in. round and square	℔ ℔	1.9 @ 2.2¢
1 to 6 in. x ¾ to 1 in	℔ ℔	1.9 @ 2.2¢
1 to 6 in. x ¼ and 5-16	℔ ℔	2.1 @ 2.40¢
Rods—¾ and 11-16 round and sq	℔ ℔	2. @ 2.30¢
Bands—1 to 6x3-16 to No. 12	℔ ℔	2.3 @ 2.50¢
"Burden's Best" Iron, base price	℔ ℔	3¢
Burden's "H. B. & S." Iron, base price	℔ ℔	2.6¢
Norway Nail Rods		5¼ @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 16 ℔ ℔	2.70 @ 3 ¢	3¾¢
17 to 20 ℔ ℔	3 @ 3.12½ ¢	3¾¢
21 to 24 ℔ ℔	3 @ 3.12½ ¢	3¾¢
25 and 26 ℔ ℔	2.25 @ 3.37½ ¢	¢
27 ℔ ℔	3.50 @ .... ¢	¢
28 ℔ ℔	3.62½ @ .... ¢	4¼¢
	B. B.	2d qual.
Galvanized, 10 to 20 ℔ ℔	5¾¢	5¼¢
Galvanized, 21 to 24 ℔ ℔	6¼¢	5¾¢
Galvanized, 25 to 26 ℔ ℔	6¾¢	6¼¢
Galvanized, 27 ℔ ℔	7¼¢	6¾¢
Galvanized, 28 ℔ ℔	7¾¢	7¼¢
American Russia ℔ ℔	10½¢ B, 9	¢
Russia ℔ ℔	11 ¢ @ 12	¢
American Cold Rolled B. B. ℔ ℔	5 ¢ @ 7	¢

Iron Wire. *See Wire.*

STEEL.—DUTY. Ingots, Bars, Sheets, &c., valued at 4¢ ℔ ℔ or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ℔ ℔, 2¢ ℔ ℔; valued above 7¢ and not above 10¢ ℔ ℔, 2¾¢ ℔ ℔; valued above 10¢ ℔ ℔, 3¼¢ ℔ ℔. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ℔ ℔ in addition to above; Steel Circular Saw Plates, 1¢ ℔ ℔ in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast ℔ ℔	15½¢
Extra Cast ℔ ℔	16½ @ 17½¢
Circular Saw Plates ℔ ℔	14½¢
Round Machinery, Cast ℔ ℔	10¾¢
Swaged, Cast ℔ ℔	16½¢
Best Double Shear ℔ ℔	15½¢
Blister, 1st quality ℔ ℔	14 ¢
German Steel, Best ℔ ℔	10 ¢
2d quality ℔ ℔	9 ¢
3d quality ℔ ℔	8 ¢
Sheet Cast Steel, 1st quality ℔ ℔	15½¢
2d quality ℔ ℔	14½¢
3d quality ℔ ℔	12½¢

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1¢ ℔ ℔; Bars, Block and Pigs free.

Banca ℔ ℔	20¼¢ @ 21 ¢
Straits ℔ ℔	19 ¢ @ 19¼¢
English ℔ ℔	19¼¢ @ 20 ¢
Bar ℔ ℔	20¼¢ @ 21 ¢

Charcoal Tin Plates.

I C 10x14 }	225 sheets ℔ box	$5.50 @ $6.25
I C 12x12 }		
I C 20x28, 1	" "	11.00 @ 12.75
I X 10x14 }	225 " "	6.50 @ 7.75
I X 12x12 }		
I X 14x20, 112	" "	6.50 @ 7.75
D C 12½x17 100	" "	5.25 @ 5.50
X 12½x17, 100	" "	6.50 @ 7.00
each additional X add	"	@ 1.50

Coke Tin Plates.

	Best.	Ordinary.
I C 10x14 }		
I C 14x20 }	$5.37½	4.87½ @ $5.00
I C 12x12	5.50	5.25 @ ....
I C 10x20, gutters, 225 sheets	8.25	7.75
I C 20x28, 112 sheets	....	10.50

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M. F.	7.25	....	....
I C 14x20 Tregoning, Old Process	....	....	$7.00
I C 20x28 " " "	....	....	14.25
I C 14x20	$4.87½ @ 5.00	$4.75 @ 4.87½	$4.70 @ 4.75
I X 14x20	6.50 @	....	....
I C 20x28	10.00 @ 10.25	9.75 @	9.50 @ 9.62½
I X 20x28	13.00 @	....	....
I C 20x200	13.50 @	....	....

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets	.. @	$13.50
IXX 14x28, 2 " " No. 8, "	.... @	14.50
IXX 14x31, 2 " " No. 9, "	.... @	16.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ℔ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake ℔ ℔	13 ¢ @	13¼¢
Ingot, Baltimore "	11½¢ @	11¾¢
Ingot Anchor "	.... @	12¾¢
Braziers' Copper, ordinary sizes, 16 oz. ℔ sq. ft. and over	.... @	21 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ℔ sq. ft.	.... @	23 ¢
Braziers' Copper, 10 oz. and 12 oz. ℔ sq. ft.	.... @	25 ¢
Lighter than 10 oz. ℔ sq. ft.	.... @	27 ¢
Circles less than 84 in. in diam.	.... @	24 ¢
" 84 in. diam. and over	.... @	27 ¢
Segment and Pattern Sheets	.... @	24 ¢
Locomotive Fire-Box Sheets	.... @	22 ¢
Sheathing Copper, over 12 oz. ℔ sq. ft.	.... @	19 ¢
Bolt Copper	.... @	22 ¢
Copper Bottoms	.... @	22 ¢
Nickel-Plated Sheathing	.... @	35 ¢
" " for boilers	.... @	37 ¢
Plating extra	35 ¢ @	37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	.... @	23 ¢

Tinning.

14x48, by the case ℔ sheet,	8¢
4x48, less than case "	8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x48

2 and 16 oz. and heavier	.35¢	By the case ℔ ℔ 34¢
12 oz. and lighter	.38¢	" " " 37¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

14 and 16 oz. and heavier	.37¢	By the case ℔ ℔ 36¢
12 oz	.40¢	" " " 39¢

(And all sizes not over 20 in. wide.)

14 and 16 oz. and heavier		℔ ℔ 39¢
12 oz		" 42¢

Copper Wire.—*(See Wire.)*

Sheathing Metal.

Yellow Sheathing Metal, ℔ ℔ ..... 20 @ ....

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17 1884 ..... dis. 20 %

LEAD.—DUTY: Pig, $2 ℔ 100 ℔; Old Lead, 2¢ ℔ ℔; Pipe and Sheet, 3¢ ℔ ℔.

American	4 @ 4.12½¢
Bar	4½ @ 4¾¢
Pipe	5¾¢
Block Tin Pipe	4¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	6¾¢, dis 20 %
Shot	Drop, 6¢; Buck, 7¢
Chilled Shot	7¢

ANTIMONY.

Hallett's ℔ ℔	11 @ 11¼¢
Cookson "	11 @ 11¾¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ℔ 100 lbs.

American, cash	4¾¢ @ 5½¢
Bergenport	9¢

ZINC—Duty: Pig or Block, $1.50 ℔ 100 lbs. Sheet, 2½¢ ℔ ℔.

600 ℔ casks	5¼ @ 5¾¢
Zinc.—Open	5¾ @ 6½¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U. ℔ ℔	7 @ 7.50¢

A, 28¢; B, 22¢; C, 14¢.

WIRE.

Iron Wire.—Put up in 63 ℔ bundles.

Nos. 00 to 9,	10, 11,	12,	13, 14,	15, 16,	17,	18.
	10	11	11½ 12½	14	15	16
Bright Market Wire						dis 65 %
" Charcoal						dis 47½ %
" Bale Wire, Nos. 7 to 12						dis 60 %
Annealed Market Wire } " Fence Wire, Nos. 8 and 9. } " Grape Wire, Nos. 10 to 14 }						dis 65 %
" Bessemer Steel Wire						dis. 57½ @ 60 %
Coppered Market Wire						dis. 60 %
" Bale Wire, Nos. 7 to 12						dis. 60 %
Galvanized Market Wire } " Fence Wire }						dis. 50 %

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis.	62½ @ 65 %
19 to 26	"	65 @ 67½ %
27 to 36	"	67½ @ 70 %
Galvanized Stone Wire	"	45 @ 50 %

Steel Wire.

Cast Steel, Stee Wire list ..... dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.79
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ½, Warranted	12½ @ 13 ¢
Extra	11¼ @ 11½¢
No. 1 Refined	10¼ @ 10½¢
No. 2 "	10 @ 10¼¢
Extra wiping	10½ @ 11 ¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 40 %
In bulk, new list, Dec. 10, 1881	dis. 40 %
Copper Rivets and Burrs	dis. 50 %

Nos.	7	8	9	10	11	12	13	14	1
℔ ℔	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 60 %
R. B. & W.	dis. 60 %
R. & E. Mfg. Co.	dis. 60 %

FRENCH GLASS.

Prices current per box of 50 square feet.
List, September 8, 1884.

Single Thick.

Sizes.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$9.50	$8.50	$7.50	$7.00
11 x 14 to 16 x 24	10.50	9.50	8.75	8.00
18 x 22 to 20 x 30	12.50	11.00	10.25	9.50
15 x 36 to 24 x 30	14.00	12.75	11.00	
26 x 28 to 24 x 36	15.00	13.50	11.75	
26 x 36 to 26 x 44	16.00	14.50	12.25	
26 x 46 to 30 x 50	17.50	16.25	13.75	
30 x 52 to 30 x 54	19.00	17.00	15.00	
30 x 56 to 34 x 56	20.00	18.00	16.00	
34 x 58 to 34 x 60	22.00	20.00	18.00	
36 x 60 to 40 x 60	24.00	22.00	20.00	

Double Thick.

Sizes.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$10.75	$10.00	$9.00
11 x 14 to 16 x 24	14.00	12.75	11.75	10.7
18 x 22 to 20 x 30	17.00	15.50	14.50	
15 x 36 to 24 x 30	18.50	17.00	15.00	
26 x 28 to 24 x 36	20.00	18.00	16.00	
26 x 36 to 26 x 44	21.25	19.75	17.00	
26 x 46 to 30 x 50	23.50	21.25	18.75	
30 x 52 to 30 x 54	24.50	22.25	20.25	
30 x 56 to 34 x 56	26.50	24.50	22.25	
34 x 58 to 34 x 60	29.00	27.00	25.00	
36 x 60 to 40 x 60	32.00	30.00	28.00	

Sizes above—$15 per box extra for every 5 inches.

All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. Discount 60&20 per cent.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents	℔ ℔.
White Shirt Cuttings, No. 1	7 @	7½
" " No. 2	5½ @	6
Mill Assorted Whites	5 @	5½
Unbleached Muslins	5¾ @	6
City Whites, No. 1	4½ @	4¾
New Canton Flannels	5 @	5¼
New Seconds, light	3¾ @	4
" dark	3 @	3¼
No. 2 Whites	2½ @	2¾
Cotton Canvas	4¾ @	5
Linen Canvas No. 1	4½ @	4¾
Seconds, City No. 1	1½ @	1¾
Seconds, City No. 2	1½ @	1⅞
Colors, ℔ cwt	40 @	50
Manila Rope	3 @	3¼
" Tarred	2¾ @	2¾
Gunny Bagging, No. 1	1¾ @	2
" No. 2	1½ @	1¾
Kentucky Bagging	1 @	..
Burlap Bagging, No. 1	1¾ @	2
Tar Shakings	1¾ @	2
Hemp Twine Stock	3¾ @	4
Hard White Shavings, No. 1	3¾ @	4
Soft White Shavings, No. 1	2¾ @	3
White Shavings, No. 2, Soft	2½ @	2¾
Mixed Shavings, part White	2¼ @	2½
Ledger and Writing	2¾ @	3
Solid Stock	2¼ @	2½
Book Stock, No 1, light	1 @	1¼
Old Newspapers	1¼ @	1¾
Pure Manilas	1¾ @	..
Bogus Manilas and Hardwares	¾ @	1
Commons, ℔ 100 ℔	60 @	70
Binders' Board Cuttings	⅞ @	1
Straw Board Cuttings, ℔ cwt	70 @	75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters' ℔ ℔	22 @ 24¢
" " Ordinary	6¢
" Ivory Drop, fair	12 @ 15¢
" " best	23¢
Black Paint, in oil kegs, 8¢; assorted cans, 11¢	
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Green Chrome	15 @ 23¢
" " in oil	14 @ 18 @ 25¢
" Paris good, 20¢; best, 25¢	
" " in oil good, 30¢; best, 35¢	
Iron Paint, Bright Red ℔ ℔	2¼¢
" Brown "	1¾¢
" Purple "	3¢
" Ground in oil, Bright Red "	6¼¢
" " " Red "	5¼¢
" " " Brown "	5¼¢
" " " Purple "	6¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	7¢
" Venetian (Eng.) dry	$1.65 @ $1.70
" " in oil asst'd cans, 11¢; kegs, 8¢	
" Indian Dry	9 @ 12¢
Rose Pink	10 @ 13
Sienna, American Raw, powdered	4¢
" Burnt, powdered	4¼¢
" " in oil	10 @ 16 @ 20¢
" Raw	11 @ 15 @ 25¢
Umber, Burnt, powered	4 @ 8¢
" " in oil	9 @ 12 @ 16¢
" Raw, powdered	3½ @ 7½¢
" " in oil	10 @ 16 @ 48¢
Vermilion, Chinese	90¢
" English	46 @ 48¢
" American, Common	15¢
White Lead, American, pure dry	6¢
" " in oil	6¢
White Paris, English Prime	2 @ 2½¢
Yellow Ochre, French	$1.75
" " in oil asst'd cans, 11¢; kegs, 8¢	
" Vermont in casks, 1½¢	
Yellow Chrome	17 @ 27¢
" " in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	5 @ 6¢
" No. 1, in oil	9¢
" French (Paris Dry)	6 @ 8¢
" " in oil	10 @ 11¢

Oils.

Linseed, Raw, in casks and bbls	54 @ 55¢
" Boiled, "	57 @ 58¢
Bleached Whale, ℔ gal	63¢
" Sperm	$1.00
" Elephant	68¢
Signal	62¢
Prime Lard	60¢
No. 1 Extra	55¢
West Virginia	8 @ 12¢
Drilling	40¢
Miners' Oil	38 @ 42¢
Fish Oil, Pressed	34 @ 58¢
Neatsfoot	61 @ 72¢
Tallow	63 @ 68¢
Empire Cylinder Oil	65¢
Machinery	40¢
Engine	50¢

Sundries.

Asphaltum, Cuban	6¼ @ 9¼
Trinidad Refined ℔ ton, $3.20 @ $3.25	
Benzine ℔ gal. 9 @ 10¢	
Chalk	3¢
" Block	¾¢
Dryers, Patent American asst'd cans, 9¢; kegs, 7¢	
Frostings	40¢
Glue, White	24 ℔ 35¢
" Sheet	20¢
Glaziers' Points, Zinc	8¢
Gum, Copal	36¢
" Damar	25¢
" Shellac, English	40¢
" " " dark	35¢
Litharge	7½¢
Mineral Wool, ordinary, ℔ ℔	1 @ 1¼¢
" extra	3 @ 3½¢
Pumice Stone, selected Lumps	4 @ 6¢
" " powdered	$2.75
Pine Tar, bbls	$2.50
Pitch	$1.65
Putty, in bladders	3¢
" in bulk	2½¢
Rosin—Common and Good—Strained	$1.60
E & F	$1.65 @ $1.75
G & H	$1.85 @ $2.00
I & K	$2.40 @ $2.75
M & N	$3.45 @ $4.00
Spirits Turpentine, ℔ bbl	33 @ 33¾¢
Whiting, Spanish	1½¢
Waste, No. 1 Cop	9½¢
Waste, No. 1 White Machine	9½¢
Waste, No. 2 White Machine	9¢
Waste, No. 1 Colored	7¢
Waste, No. 2 Colored	6½¢
Waste, Washed Machine	9¢

The First Iron Works in New Jersey.

The following interesting historical statement was compiled by O. B. Leonard for the Plainfield (N. J.) *Times*:

The first mining for iron ore in New Jersey was begun in Monmouth County, on a tract of land near Shrewsbury, originally owned by James Grover, an early pioneer who had settled at Gravesend, L. I., in 1646. On account of his opposition to the Dutch Government and proclaiming in favor of Cromwell, in 1655, he left Long Island, disposing of his plantation to Thomas Delavall, in 1666. The following year he appears at Middletown, in this State, as one of the original patentees of the "Monmouth patent," and was chosen the first town clerk and surveyor of the township. These positions afforded him excellent opportunities for inspecting all the territory included in the patent, and enabled him to locate such lands for himself as he might select. Within a few years after taking up his portion of the land grant it was decided that the wet, boggy meadows on this tract contained valuable deposits of iron ore, and steps were taken for their development. As the only forges, furnaces and bloomaries in the country then were in Eastern Massachusetts, it was natural to resort thither for competent mechanics and skilled workmen to superintend the erection of suitable works and assist in manufacturing the metal from the crude mass. It is reported that the Leonard brothers, James and Henry, of Taunton, Mass., came to New Jersey for the purpose of building the iron mills on this plantation. They were at that time interested in most of the iron works in operation in the Eastern colonies, having assisted in their construction. They came from England about 1642, where the Leonard family had been engaged in the iron business for many years. These brothers settled in Massachusetts, and were at work in a bloomary at Braintree in 1646, at Raynham and afterward at Taunton in 1652, erecting there the first forge in the Plymouth colony. (The accuracy of this statement is questioned by Mr. James M. Swank.)

Under date of October 25, 1675–76, James Grover and others deeded to Lewis Morris, of the island of Barbadoes (uncle of Governor Morris), a triangular piece of land containing 3540 acres, being part of the original patent obtained in 1667. This grant gave the purchaser and his associates "full liberty to dig, delve and carry away all such mines for iron as they shall find or see fit to dig and carry away to the iron works, that shall be found in that tract of land that lies inclosed between the southeast branch of the Raritan River and the Whale Pond on the seaside, and is bounded from thence by the sea and branch of the sea to the eastward to the Raritan River, he or they paying all such just damages to the owners of land where they shall dig as shall be judged is done by trespass of cattle, or otherwise sustained by the carting and carrying of the said mine to the works." This plantation Colonel Morris carried Tintern or Tinton, named after an estate which had belonged to the family in Monmouthshire, England, and may be more accurately described as bounded by the Atlantic on the east, Neversink River (the branch of the sea) on the north and west, and the Whale inlet on the south. From the earliest town records and other public documents it is ascertained that the smelting furnace and extensive iron works in operation on this "ore tract" employed during 1680 70 negroes and many white servants. The ore used was found in wet meadows and swamps, known as "bog ore," being a hydrous peroxide of iron containing 40 per cent. of metallic iron. These and other similar ores dug from undrained marshes of the eastern coast of the State furnished much of the material for the early iron works of Massachusetts and Pennsylvania during the Colonial times.

The iron made here was said by the resident proprietors to be of very good quality, and the trade was of great benefit to the province of East Jersey. The usual price obtained for a ton of the iron ore was $6.50, and a ton of bar iron at that time brought in London £18. Of so much importance were these works thought to be for the development of the territory that in response to a petition of the owner to the provincial authorities for public protection and encouragement special legislation was adopted in his favor. By a vote of the General Assembly April 6, 1676, it was enacted, "as touching Colonel Morris's request, the deputies are willing the lands and works belonging properly to the iron works shall or may be rate free for seven years, excepting in extraordinary cases, as war or the like."

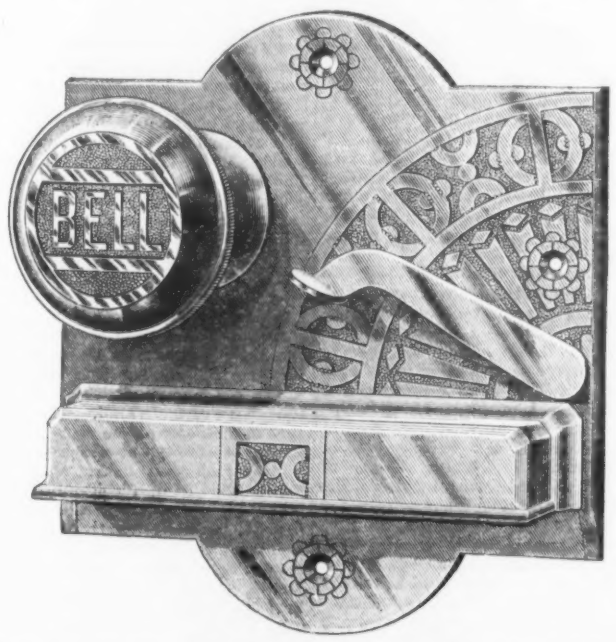
It appears from letters of early settlers in the towns of Shrewsbury and Middletown to their friends and relatives in England and Scotland that during the whole length of time these iron works were exempt from taxation (1676–83) Colonel Morris was successfully pursuing this valuable industry, encouraging skilled workmen, and affording employment to a large number of laborers. He died in 1691. All the charcoal furnaces and forges established for working these ores in New Jersey before the Revolution are now abandoned; the leanness and amount of sulphur and phosphorus contained in the ore led to their discontinuance 50 years ago. The deposits are still being renewed in the same localities by the infiltration of the surface water containing oxide of iron into the undrained swampy soil of the bog. These ores may be of value some time again, when improved processes of working them shall be devised which will make it remunerative to the manufacturer. To Monmouth County, then, must be awarded the honor of having successfully established the first iron works in New Jersey not later than 1676. It was not till 1710 that forges were built in Morris County for working the magnetic ores, though smelting was done in "The Old Forge" there as early as 1686.

Another Colossal Russian Railroad Project.—The St. Petersburg correspondent of the London *Times* writes that "the German and Russian newspapers refer to another gigantic railway scheme believed to be entertained by the Russian Government—to wit, a great Pacific railway running from Ekaterinburg, through Toboisk, Yeniseisk and Irkutsk, to Nikolaievsk, on the Amoor, with one branch to Irkutsk and Kiakhta, another to Herat and India, and a third to Bokhara and Kashgar. This wonderful scheme is to have 21,000 versts of road, and to cost—we must presume, when the Imperial finances have improved—one milliard of roubles, or 50,000,000 roubles per year for 20 years."

HARDWARE NOVELTIES.

The Lexington Combination Door Lock.

We present herewith engravings of a new lock, the Lexington Combination Door Lock, which contains some novel features. In its use a key is entirely dispensed with, it being practically, as its name indicates, a combination lock adapted for use on doors, in connection with a door bell and alarm. Fig. 1 represents the outside portion of the lock, which forms a handsome ornament to the door, and Fig. 2 the inside, together with a view of part of the interior, which is exposed by the drawing back of the slide, preparatory to altering the combination. When in ordinary use as a lock the door is opened in the following manner: Under the shield shown on the lower part of the lock in Fig. 1 are a number of small flat hooks. Certain of these, according to the numbers on which the combination is set, are pulled out, while at the same time the knob is turned, or if using but one hand the latch is pressed down with the thumb, and the door opens. If any but the right hooks are pulled out, as by some one who desires to enter and steal, the lock will not open, and not only this, but in case the wrong combination is touched an alarm is at once rung on the gong and the attention of those in the house attracted. Ordinarily the bell will also ring when any one enters, and may also be used as a door bell, the word "bell" on the knob calling the attention of those who are unacquainted with the use of the lock. The combination of this lock may be set in several hundred different ways, and it is therefore practically as efficient as the ordinary safe combination lock would be on a door, with the advantages that no light and no great precision of movement are required to unlock it. The combination is set or changed by drawing out the slide, as shown in Fig. 2, and turning around the little blocks in such a manner as to set the lock on the numbers desired. The cut shows the combination set on Nos. 5 and 7. The lock is so arranged that the slide can be drawn out only by those who know the combination upon which it is already set; so that it is impossible for an intruder to examine the lock and ascertain the combination for the purpose of future entrance. Two studs are on the rim of the lock—one above and one below the bolt—the upper one being shown in Fig. 2. The one below throws off the combination, while the other one throws off the bell. The combination being thrown off, the door is unlocked and opens by turning the knob; but in this case the bell rings and apprises those in the house that some one has entered. In fact, when the bell rings, it is known that either some one has entered, is ringing the bell to enter (as door bells are rung) or is tampering with the lock to gain entrance. The bell never rings to those acquainted with the combination, except when used as a door bell. If the top stud is thrown off also, the lock is then changed into an ordinary knob latch, opening without the combination and without giving an alarm. Further, the lock can be changed into a dead lock, so that even those who know the combination cannot open the door from the outside, while every attempt to do so will ring the bell. A stranger on the outside cannot tell whether the door is dead locked or not. On the inside the door opens like other doors, without ringing the bell and without the aid of the combination. Arrangements may also be made by which an attempt to open the lock by one not knowing the combination will, by means of electric connections, ring a bell or light the gas in any portion of the house. The lock is the usual size of a rim door lock, the illustrations being two-thirds size, and is gotten up handsomely in either bronze metal or nickle plate. It is manufactured by the Lexington Manufacturing Company, Lexington, Ky.



The Lexington Combination Door Lock.—Fig. 1.—View of Lock on Outside of Door.

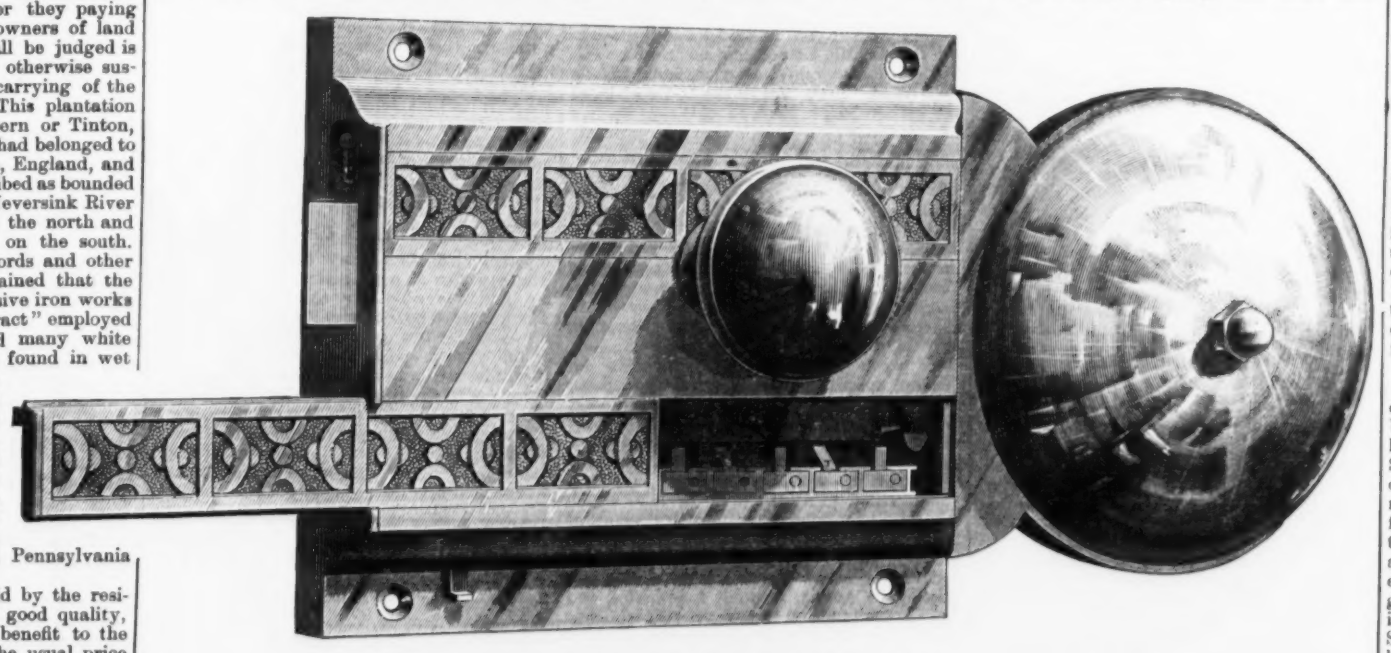


Fig. 2.—View of Lock on Inside of Door.

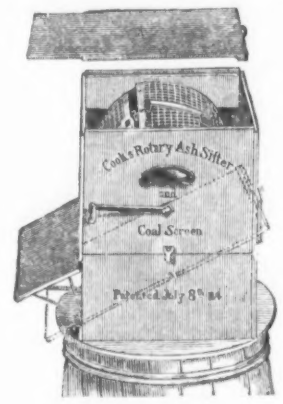
Cooper's Patent Rivet Cockeye.

This article, which is made by C. J. Cooper & Co., Chicago, and represented in the accompanying illustration, is composed, it will be seen, of two pieces fitting together as indicated in the cut, the japan holding them in place. To disconnect the parts the center rivet is to be tapped lightly with a hammer, which throws the arm up clear from the shoulder and allows the loop piece and arm to be separated. This cockeye may be attached to the trace by slipping the arm bar into the fold at the end of the trace, placing the shoulder of the loop piece upon the rivet of the arm bar, and allowing the loop to drop over the center rivet, when the rivets at the center and side may be headed down. The manufacturers claim that this makes a stronger and more easily adjusted cockeye than the old screw pattern.

Cooper's Patent Rivet Cockeye.

Rotary Ash-Sifter.

The accompanying illustration represents a new Rotary Ash-Sifter which has recently been put upon the market by Burton H. Cook, 32 Fulton street, Brooklyn, N. Y. As may be seen by the engraving, a cylinder made of wire, with meshes of such a size as to readily allow ashes to pass through, and yet to retain any burnt coal there may be, has on one side a hinged door. This being opened allows the ashes to be poured in. After it has been closed the sifter is revolved, which has the effect of separating the ashes from the unburnt coal. The lid of the apparatus is in place on the top while this is being done, which insures freedom from dust, the ashes falling directly into the barrel. After the ashes have been disposed of in this manner the lid is taken off from the top of the sifter, which the peculiar construction of the hinges permits, and is placed in the second position, shown by lines dotted diagonally through the body of the device. As the lid is slipped into this position it forces open the hinged door, shown near the bottom at the left, which forms the outlet for the unburnt coal. The wire cylinder is then opened as mentioned, and, on being revolved, the unburnt coal drops downward against the inclined plane formed by the lid, and then slips outward into the coal hod set in the proper place to receive the same. The cylinder is 10½ inches in diameter, 10½ inches long and has a capacity of a large scuttleful of cinders, or, otherwise expressed, of about 30 pounds. The inclosing box is about 13½ inches square and 20 inches n hight. It has a circular piece 19 inches n diameter, which is made to fit the head of any barrel. It has a projecting rim to keep it from sliding off. The crank is provided with a clutch which keeps the cylinder in position while pouring in the cinders. The lid when used as a chute for discharging the unburnt coal in the scuttle, as above mentioned, effectually shuts off the dust from the barrel. The door which it opens when put in position for this purpose is operated by a spring, and closes automatically when the cover is withdrawn. From this it will be seen that the sifter is ash or dust tight at all times. Among the special advantages to which the maker directs special attention may be mentioned the strength and durability of the apparatus, and that wet cinders may be sifted by it just as well as any cinders. The parts are all made to standard sizes and shapes, so that repairs, should any ever be required, can be obtained at a minimum of expense. All that will be necessary to do under such circumstances is to order a new part, whatever it may be, which, on receipt, will be sure to fit. Removing cinders, stones, &c., which are unburnable, and which it is desired to deposit in the barrel with the ashes, is accomplished by lifting them from the cylinder with the hand and dropping them down alongside of the cylinder, the lid in the second position being sufficiently withdrawn at the time to permit their passage. After the cinders have been sufficiently assorted in this manner, what remains are thrown into the scuttle, as already explained. During this sorting the large unburnt cinders may always be kept at the top by replacing the lid and turning the cylinder a single revolution. The maker estimates that by thoroughly sifting cinders fully one-third of every ton of coal burned will be saved. On the basis of this argument it would seem that there should be no difficulty in finding sale for goods of this class.



New Rotary Ash-Sifter.

The Keystone Horseshoe Company Asks an Extension.—On October 21 it was announced that the Keystone Horseshoe Company had closed their works at Seventeenth and Clearfield streets, Philadelphia, and asked creditors for an extension of 12 and 18 months. George H. Boker is president of the company and William Gerhard secretary and treasurer. The company was incorporated in March, 1880, with a capital stock of $125,000 and a paid-in capital of $120,000. The subscribers to the stock at that time were Wm. Gerhard, Thomas F. Dixon, H. Dupont Gerhard, John S. Gerhard, Bradlee & Co., George H. Russell, of Newark, N. J.; J. D. Dixon, of Ardmore; J. M. Fox, of Foxburgh, Pa.; James Hopkins and T. H. Dixon, their holdings ranging from 10 to 600 shares. The purpose of the company was said to be the manufacture of a patent horseshoe, but that was abandoned for the working of bar iron. An officer of the company stated that the embarrassment was for a comparatively small amount, but declined to give the exact sum. It was further stated that the difficulty was of a temporary character, and was due to depression in business. The indebtedness for which the extension was asked was for bills payable, and not bonded indebtedness, and all the creditors who had been seen had consented to grant that which was asked for, and, if all of the creditors agreed, the works would probably be reopened on Monday. If they did not, resumption of work would possibly be deferred for three or four weeks. It was also said that there had been no substantial change in the list of the stockholders.

The Kortenhaus Royalty Suit.

At Philadelphia, on the 18th inst., a verdict was rendered by a jury in the suit of Charles A. Kortenhaus against the American Watch Company of Waltham, Mass. The case had been on trial for a week, and much testimony was taken. Kortenhaus claimed to be the inventor of an improvement in the stem-setting apparatus for watches, and he alleged that the defendants got his idea and used it in 80,965 of their watches. He contended that his improvement was worth 50 cents per watch, which would have made his claim aggregate $40,000. It came out in the testimony that the watch company turn out 1000 watches a day, and that their profit on watches of the class in which the improvement was used was only 78½ cents per watch. Kortenhaus never got a patent, and, as the law recognizes no property in ideas, he contended that the defendants got the idea from him in a "relation of trust and confidence," and the judge told the jury that if this were so there was an implied contract to pay for its use, and the plaintiff had a good case, so far as this branch of it was concerned. The defense was threefold; first, that they did not get the improvement in a confidential relation—that, in fact, they did not get it at all; second, that the device was not a mechanical novelty, as a similar combination was in use in the Elgin watch and Swiss watch before Kortenhaus' improvement of December, 1882; and, third, that Kortenhaus was not the original inventor of the improvement, but, on the contrary, a workman named Haynes invented it in Waltham 10 months before Kortenhaus.

With respect to the third point in the defense, four workmen from Waltham testified that they saw Haynes's invention in the spring of 1882, while Kortenhaus did not make his improvement until December of that year. The judge said that he failed to find any direct evidence that there was any substantial difference in the improvements of Haynes and Kortenhaus, but he left the whole testimony on the three points named to the jury for their decision. After being out several hours the jury returned a verdict for the plaintiff for $8000.

The New Atlanta.—The new steel cruiser Atlanta, which was built for the United States Navy by John Roach & Son, has arrived at New York from Chester, Pa. She is now at Roach's shipyard, at the foot of Ninth street, where the fitting in of her machinery will be completed. She was towed from Chester to this port by two large ocean tugs. It is hoped that the new cruiser will attain a speed of about 17 knots an hour. Her engines will be of the newest pattern and of great power. The *Times* says: The Atlanta is not a very handsome vessel in appearance. She has a long ram-like stem, and is very broad. A large house of steel covers the greater portion of the main deck. This house is quite high, and bulges up in the center. On either side are places which somewhat resemble the bay windows of a house. Guns will be placed in these. The forward and after ends of the deck-house are flat, and apparently would offer a good target to an enemy. The masts of the Atlanta have not yet been put in, but it is understood that she will be bark-rigged. She is 276 feet long at her water line, and 270 feet between perpendiculars. She is 34 feet deep, and her breadth of beam is 42 feet. She will draw 18½ feet of water, and her displacement capacity is 3000 tons. The hull is divided into 72 water-tight compartments. There are eight complete transverse water-tight compartments, and on the sides through the boilers' space are longitudinal bulkheads. Under the machinery is an inside water-tight bottom. There are 12 water-tight cells between the two bottoms. The Atlanta will carry two 8-inch long rifle guns, which will be mounted on barbettes; six 6-inch breech-loading guns, and eight revolving guns.

The Vanne Aqueduct, in France, which is some 37 miles long is said to be the most important and costly work that has ever been constructed of artificial stone. This aqueduct, which supplies the city of Paris with water, traversing the forests of Fontainebleau its entire length, comprises 2½ to 3 miles of arches, some of them as much as 50 feet in hight, 11 miles of tunnels, and eight or ten bridges of from 75 to 125 feet span, for the bridging of rivers, canals and highways. The smaller arches are half-circles, and are generally of a uniform span of about 39 feet, with a thickness at the crown of some 16 inches; their construction was carried on without interruption through winter and summer, and the character of the work was not at all affected by either extreme of temperature. The spandrels were carried up in open-work to the level of the crown, and upon the arcade thus prepared the aqueduct-pipe was molded of the same material, the whole becoming firmly knit together into a perfect monolith. The construction of the arches was carried on about two weeks in advance of work on the pipe, and the centers struck about a week later.

New Inventions.

A cross-cut saw patented by J. E. Emerson, of Beaver Falls, Pa., is constructed with a view to making it so cheap that it will not be economical to dress the teeth more than a few times. The blade is very narrow, with slightly convex curved opposite edges. The usual scoring and clearing teeth are formed on both edges of the saw. The scoring teeth on one edge are set to cut the width of the kerf, while the teeth on the other edge are not set, but remain on the same plane with the saw blade. After the set teeth have been filed once or twice the saw blade is taken from the handles and the set scoring teeth are hammered out. Then the teeth on the opposite edge are used as cutting teeth, and the scoring teeth on that edge are set to cut the width of the kerf, so that practically a new saw is formed.

J. Lyons, of Pittsburgh, Pa., has patented an apparatus for recovering copperas. In the manufacture of ironware the iron is at different stages pickled to remove the scale. To abstract from the exhausted pickle the iron and sulphuric acid is the object of the invention. To this effect the pickle is boiled in a tank to evaporate some of the water, and is then allowed to cool in vats. During the cooling the copperas crystallizes and adheres to the internal surface of the vats. From thence the copperas is removed, and the residual liquor is pumped into a second tank, where it is again thoroughly boiled. By this second boiling the water is reduced to about 50 per cent. or less of the whole mass. Next the liquor is conducted to lead-lined vats, and again allowed to cool. In this second cooling the remainder of the copperas is crystallized, and the liquor which remains is sulphuric acid of 40° to 60° of strength. The copperas is removed and the sulphuric acid is placed in carboys and is ready for use a second time in the pickling process.

A cutter-head which will make a smooth groove or channel transverse to the grain of the wood by a single passage and with flat bits has been patented by N. W. Thompson, of St. Louis, Mo. The cutters are arranged in pairs, one cutter of each pair projecting further from the cutter-shaft than the other. The cutters are set obliquely upon the head in such a manner that the shorter side of the cutter shall be in advance of the longer side. Thus in making transverse grooves the cut is not against the grain, but with it. The cutters in each pair are arranged against one another, and in this way they cut opposite sides of a single groove or channel alternately, one cutter clearing the way for the other.

An improvement in metal columns, girders and pilasters to be used in the construction of buildings has been patented by E. M. Butz, of Allegheny Pa. Four straight metal plates form the sides of a rectangular column. One main diagonal plate or brace extends centrally through the inside of the column, and is jointed to two opposite corners. The other brace is made in two pieces, each having a flange at its inner end, by means of which it is joined to the main brace. In constructing the column the auxiliary braces are first secured to the main brace by means of bolts, and with their flanges turned in opposite directions. The side plates are then secured by rivets passing through their flanged edges and also through the ends of the braces. Thus each side plate is connected at one of its sides to the main brace, and at the other side to one of the auxiliary braces.

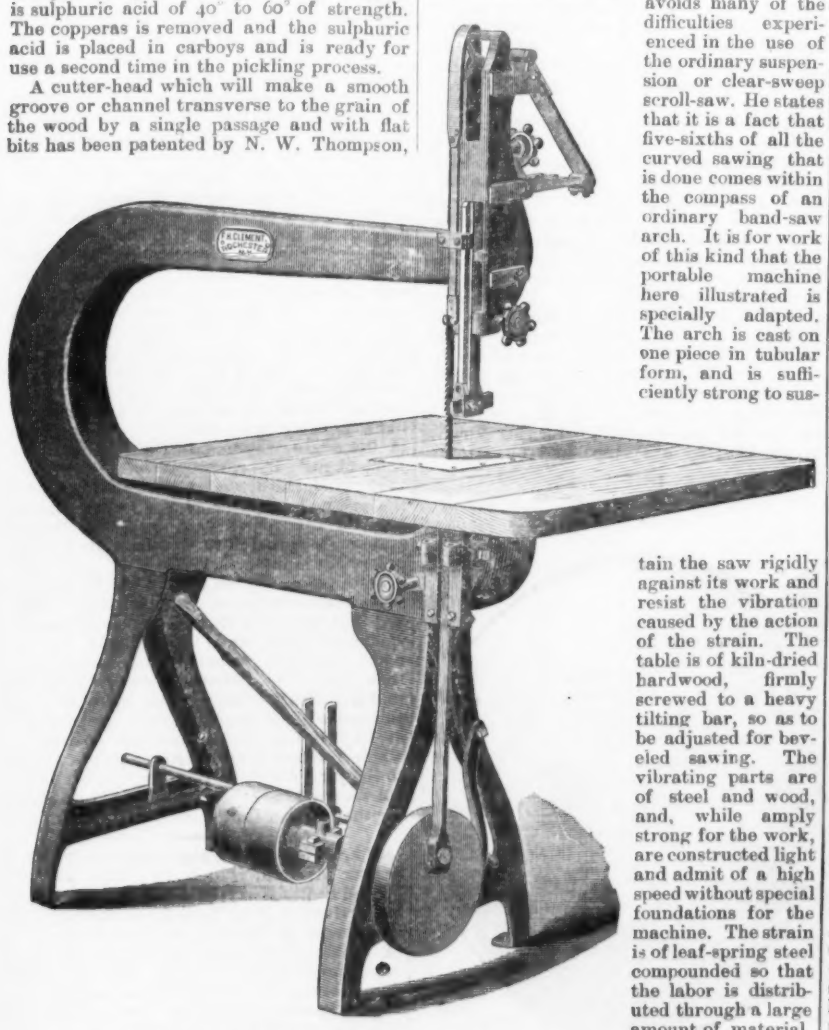
A metal-shearing machine for cutting plates or bars of metal has been patented by R. I. Knapp, of Half Moon Bay, Cal. It consists essentially of a heavy metal base, to the upper side of which the fixed shear blade is attached. The movable blade is weighted and reciprocates above the base between two upright guide-posts. The two blades are so fixed in their respective supports that their cutting edges will pass each other with a shearing action, one end of each being nearer together than the other end. In order to raise the upper blade and control its movements it is provided with an upwardly-extending flattened stem which extends between two horizontal rollers. To one of these rollers suitable driving mechanism is connected. The other roller is journaled in supports which may be moved horizontally toward or away from the stem. In this way the stem may be either clamped when it is to be raised, or it may be released when it is to drop.

A wrench made in a novel manner has been invented by E. H. St. John, of Toledo, Ohio. The lower edge of the main bar of the wrench is serrated, to engage serrations of the movable jaw which encircles and slides on the bar. At the upper end a flat spring is interposed between the bar and jaw which has the tendency to cause the racks to engage. If the jaw is to be moved backward or forward it is only necessary to press down the spring, when the racks become disengaged. The spring is provided with two shoulders which rest against the edges of the jaw and serve to keep the spring in place without rivets or other fastenings.

The Slotted Rivet Company, of Nashua, N. H., are the assignees of a recently-patented rivet. This rivet has the head and shank made of one piece. The shank tapers from the head downward, and is slotted centrally to within a short distance from the head. It is claimed for this rivet that when it is clinched the prongs will bend near their ends, and not near the head, as heretofore, and thus give a smoother and stronger hold on the material through which the rivet is inserted. The claim of the patent covers a rivet composed of a solid head and bifurcated tapering shank, all made of one piece of metal.

Portable Scroll-Sawing Machine.

The engraving herewith shows a new Portable Scroll-Sawing Machine built by Frank H. Clement, 131 Mill street, Rochester, N. Y. This machine has been built from new designs, and the maker claims that it avoids many of the difficulties experienced in the use of the ordinary suspension or clear-sweep scroll-saw. He states that it is a fact that five-sixths of all the curved sawing that is done comes within the compass of an ordinary band-saw arch. It is for work of this kind that the portable machine here illustrated is specially adapted. The arch is cast on one piece in tubular form, and is sufficiently strong to sustain the saw rigidly against its work and resist the vibration caused by the action of the strain. The table is of kiln-dried hardwood, firmly screwed to a heavy tilting bar, so as to be adjusted for beveled sawing. The vibrating parts are of steel and wood, and, while amply strong for the work, are constructed light and admit of a high speed without special foundations for the machine. The strain is of leaf-spring steel compounded so that the labor is distributed through a large amount of material, while the actual motion required is very slight. The bearings of the rocker and its attachments are of steel bronze, made in a form to reduce friction and weight to a minimum. A combined brake and shifter is attached by which the machine may be stopped almost instantly. In all other respects equally careful attention has been given to details and to the requirements of work. The machine is provided with various adjustments adapting it to a wide range. Saws may be used up to 14 inches in length. The machine has a 4-inch stroke, saws 5½ inches deep, and to a center of 84 inches.



New Portable Scroll Sawing Machine, Built by Frank H. Clement, Rochester, N. Y.

Iron Shipbuilding and its History.

The eighth volume of the Census Reports of 1880, in its chapter upon the shipbuilding industry of the United States, gives an interesting sketch of the origin and development of the practice of employing iron in place of wood in the frames and outer planking of vessels—a topic in reference to which there is no little inquiry and dispute. Over 80 years, it seems, have elapsed since the first iron vessel was built, this being a little canal boat with a wooden frame and bottom and sides of boiler iron. Its lightness and buoyancy attracted much attention, and led to the construction of other boats of the same class. The first iron steamer was manufactured at Horsley, England, in 1821, put together in London, and sent to France for use. In the 10 years following a number of small iron steamboats were built for companies in England and on the Continent. Packets for use on the English coast were next built, and finally, in 1838, sailing vessels of from 200 to 300 tons register were built at Liverpool and elsewhere for the foreign trade. Two years later the iron shipbuilding industry was largely developed, the opinion having gained acceptance that, in England at least, for all large tonnage it was cheaper to build of iron than of wood. The lighter weight and longer life of the iron vessel, as well as the fact that it costs from $10 to $20 per ton less than the wooden vessel, has gained for the former such a decided preference that in England the production of wooden tonnage has steadily declined year by year, until, in 1884, it has virtually come to an end. It may be added that the first large iron steamship and the first large ship in which the screw propeller was used was the Great Britain, which made her first voyage from Liverpool to New York in August and September, 1845. Her designer was Brunel, who is so well known to fame as having constructed the Great Western in 1838 and the Great Eastern in 1859

The first iron vessel put together and used in America was the Codorus, which was exported in pieces from England in 1825, and first employed on the Susquehanna River, in Pennsylvania. In 1835 there were five iron steamers in use on the Savannah River, built, it is supposed, in the North. In 1836 an iron steamer of 600 tons was launched at New York, and in 1838 another was built at Pittsburgh. In 1841 Boston, and in 1842 Philadelphia, added their names to the list of producers of this class of vessels. Baltimore's record begins, it is stated, with the new type of express steamer launched by Ross and Thomas Winans in 1858. "Baltimore," says the writer of the special report of the census upon the shipbuilding industry, "is favorably situated for the construction of iron vessels," but "the war interrupted the growth of the business." But in 1872 Woodall & Co. built two iron sailing vessels, and others were afterward constructed by the same firm. The regular iron shipyard of Malster & Reaney, established in 1876, had up to the census year built eight iron steamers of lengths varying from 42 to 155 feet. In 1874 the iron tonnage built in the United States, exclusive of some vessels built on foreign orders, was 33,097 tons—a figure that was not again reached in any subsequent year up to 1881, the tonnage of the latter year being but 28,536 tons. The most elaborate and complete plant for iron shipbuilding in this country is that of John Roach & Son, at Chester, Pa., which is said to represent an investment of about $1,000,000. In the 10 years from 1873 to 1882, both inclusive, the iron tonnage built by Roach has aggregated 148,000 tons. The City of Peking, the City of Tokio, the Para and Rio de Janeiro were large vessels built by this firm for the foreign trade. It may be added that steel has taken the place of iron in England in the construction of ships, and is beginning to be largely employed for this purpose in this country.

German Workingmen Viewed by English Eyes.

Thomas Lemon, who visited Germany as a member of a workingman's delegation from England, has returned home, and, upon being interviewed by an English paper, makes a favorable comparison of German with English industrial conditions. With respect to the hours and wages of the working classes, Mr. Lemon had not time to collect any considerable mass of facts, but he discovered "that, though the hours of labor are rather longer than in this country (for the most part 10½, with longish intervals for meals), the rates of pay are higher than I had thought. In Berlin, for instance, a laborer in the building trade will get about 4/8 for a day's work, and men engaged in the manufacture of iron wire, an important industry, will make as much as 8/6 a day, the system in this latter case being task work. The wages paid at Madgeburg did not influence me, as the sugar industry is at present in an exceptional state of prosperity. Then they don't labor there as we do in England; they don't work as if their soul's salvation depended upon the completion of their task. They take things in a very leisurely way. Watching some building operations in progress in front of the hotel at which we stayed in Berlin, I also noticed that in the course of the day the workmen paid frequent visits to a little cask of beer which stood in a corner—a custom undreamt of here. Another incident which impressed me was this: A sugar-refinery which we visited we found closed for a month, according to annual custom, for repairs, and we naturally asked the proprietor, who was taking us round, what became of his workers during these suspensions for repairs? 'It is not the fault of my men that the factory is closed,' he replied; 'and as, during the time it is closed, they will have at least the same need for money as when they are at work, I pay them a proportion of their wages.' Of course, this employer might simply be animated by the shrewd wish to keep his staff of workmen together. There appear to be no trade unions, as we know trade unions in this country. Whenever any movement arises among the workmen, the large shops first take individual and subsequently co-operative action; but there is no permanent framework nor permanent subscriptions. At present I perceive no prospect of any trade organization that is calculated to prove of value, either from a domestic or international point of view. My view as to the situation in Germany itself in regard to wages and the conditions of labor is that perfect peace and contentment exist. 'I went to Germany,' concluded Mr. Lemon, "with a prejudice against its Government and its people; but, being able to compare the Germany of the past with the Germany of the present, I must say I would be quite content to witness in my own country such an ameliorative revolution as has taken place there. You may call it what you like—you may call it State Socialism, or any other kind of Socialism—I believe that it is a stage of development through which we will have to pass before the population of this country can reach the full measure of their prosperity, comfort and happiness."

The extension of the Brighton Electric Railway, says an English exchange, having now been in active operation for six months, a few particulars may be interesting as showing the capabilities of a light line of this description. The car mileage amounted 15,600 miles, or 100 miles per diem, and the number of passengers in round numbers 200,000. No accident has occured to either the general public or to passengers by the car. The consumption of gas in the gas engine has been 300,000 cubic feet, or 13 cubic feet per passenger per mile. The total cost of traction, including interest and depreciation on engine, dynamo and motor, cost of gas, oil and attendance, has amounted during that period to 15/6 per day, 100 miles run, say 2d. per mile. The car service has only been stopped for one day, through the tires of the wheels giving out, owing to the heavy pressure of the holiday traffic, there being at the time no second car available.

The Manufacture of Iron Masts.

The Brooklyn *Eagle* of recent date contains the following statement, which will be of interest to our readers, though marred by a spirit of unfriendliness to the great shipbuilder, John Roach, and evidently prepared by an amateur in technical matters:

In the big boatshop adjoining the Navy-yard dry dock a busy gang of workmen are hard at work learning the rudiments of a new navy-yard industry. They are trying to make iron masts, and for amateurs are succeeding admirably. Up to date such vessels as are said to compose the United States Navy are sparred throughout with wood. The new masts are not intended for use in the old navy, but are designed to embellish the new and alleged cruisers now being fashioned by the ingenious Mr. John Roach. The workers in the boatshop have one mast nearly finished and are framing another. The two are meant for the newly-launched cruiser Atlanta, now due at the yard.

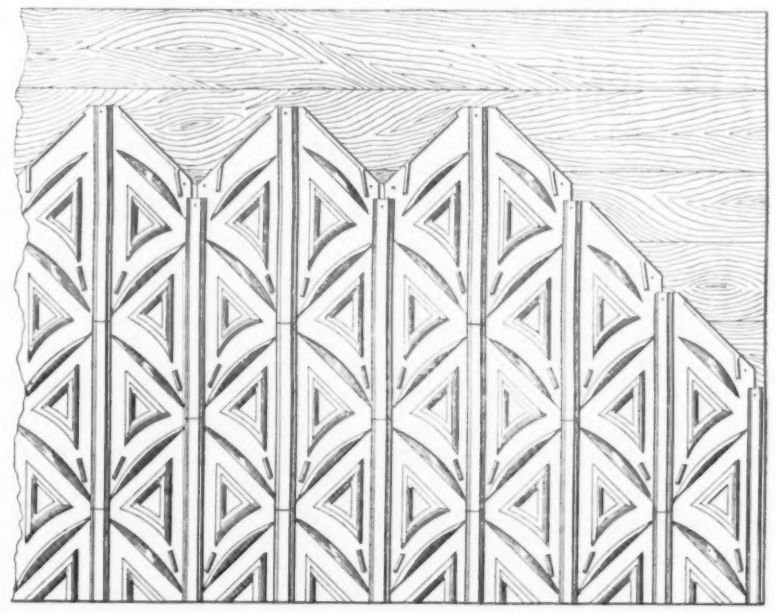
Most people think an iron mast is cast and solid, and wonder why its weight doesn't pull it up by the roots or punch a hole in the bottom and slide through. This shows how easy it is to be mistaken. An iron mast is really lighter than wood. A 60-foot stick of spruce or yellow pine 2 feet in diameter at the base weighs far more than the shell forming the modern iron steamship masts. These masts for the Atlanta will be fine specimens of their kind. The mainmast is 2 feet in diameter at the base, tapering to 17 inches at the top, at which point the funnel will be fashioned square, making a marked distinction from foreign-made mastheads, which are left round. The mainmast is 68 feet 4½ inches in length, and the foremast 2 inches shorter. The method of construction is peculiar. Three T-shaped rods of steel the length of the mast to be made are affixed base outward in circular wooden frames, and around the skeleton thus formed the ready-shaped plates are riveted in place. The plates are 12 feet in length and about ⅜ inch in thickness. They are sold to the Government as steel by a Pennsylvania firm, but are rather made of first-class iron, or, if steel, of a very mild type—at least so say the mechanics working it.

The present force is likely to be kept busy long, as all the new vessels are to be thus equipped. Aside from lightness and little danger from breakage, the iron masts have the advantage of suffering but slightly from cannon shot in war, and will not splinter. Inside strong lateral braces give perfect steadiness, so that no solid shaft would be more inflexible. The yard shops are turning out some heavy ironwork just now, beside framing together the 11-inch armor plates of the Miantonomah. Mr. Parsells is laying the floor of the latter craft's gun deck with sheets of iron ¾ inch thick, 3½ feet wide and 24 feet long, each weighing 3000 pounds. Years ago a 12-foot plate was considered the acme in rolled sheets, and so little was it thought that their length would be increased that a heavy rolling machine when put to work in the shop was placed so near the wall as to be unavailable now. A few days ago a rolling machine of immense proportions arrived at the yard. It will be set up in the new shop in construction next to the Intrepid. The three rollers weigh 25 tons—the two bed rolls scaling 8 tons each and the upper one 9; altogether it weighs 45 tons. It will be used on the naval destroyers to be built in the hereafter, and on the two now being repaired.

CONTENTS.

New Form of Tin Roofing.

We have already alluded to the importance of the fact that new forms of tin roofing are continually being brought to the attention of builders and roofers, and have remarked that for the future it will not do to speak of standing-seam and flat-seam tin roofs as the only distinctive kinds in the market There is at least one other general kind now in very common use, and of this several different forms are before the public, It may be described as being composed of plates or shingles, in contradistinction to those coverings the parts constituting which are joined by soldering or double-seaming. The Anglo-American Roofing Company, whose office is at No. 22 Cliff street, New York City, are now offering a new form of this variety of tin roofing, which they designate as the "best tin roofing in the world." It is an-



Section of a Roof Covered with the D. T. Roofing Plate, Made by the Anglo-American Roofing Company, New York.

other candidate for favor among the so-called metallic shingles or tile. It possesses certain advantages over some of the forms that have preceded it, and is undoubtedly worthy of more than passing attention upon the part of all who are interested in roofing-work. The essential features of this roof may be gained from an inspection of the accompanying engravings. The first shows a single tile or shingle ⅛ full size The shingle is struck up from 15 x 15 tin plate, and lays 12 x 12 inches to the weather. Accordingly, a hundred plates or shingles are sufficient to lay a square of 10 x 10 feet, or 100 square feet. This fact alone, inasmuch as it facilitates calculation of the amount of material required to cover a given space, will recommend this form of roofing in many directions. The second engraving shows the manner of laying these roofing plates. By reference to the section shown below Fig. 1, it will be seen that the central longitudinal rib is so formed as to present grooves at the sides. It is also tapering, the lower end measuring fully ⅛ inch in width more than the upper one. The plates are

Elevation and Section of the D. T. Roofing Plate, ⅛ Full Size.

laid flat upon sheeting boards or upon lath, as the case may be, and are nailed through the flanges, as shown in the upper part of the second engraving. As each succeeding course is laid, the flanges through which the nails are driven are completely covered, while the ribs to which we have already referred slip down over the ends of those below, lapping them some 3 inches. Each of these ribs is nailed at the upper end, as shown in the engraving. The side flanges of the adjacent shingles come under the projecting edges of the center rib, and, therefore, as each course of shingles is put in place, by the lapping or dovetailing, as above mentioned, the plates are held firmly together, and yet in such a way as to permit expansion and contraction freely in all directions. These plates are known to the trade as the "D. T. Roofing Plates." The reason for calling them by that name is that the center rib of each plate is made as we have described, so that the one above laps over the one below, forming a dovetailed joint. By this means the plates are firmly held together, the under and over lapping plates being nailed to the roofing boards, as shown in the engraving. We understand from the manufacturers that these plates are being made from the best charcoal iron and coated with pure tin. The company are putting them upon the market made of bright instead of terne or leaded plate, in the belief that pure tin coating provides a better protecting against oxidation than a lead coating. The same style of roofing plates is also manufactured in iron and finished by painting, also by kalameining. The Anglo-American Roofing Company are now establishing agencies for these shingles, and are arranging with but one party in a place, thus making this form of roofing a leading specialty with those who take hold of it.

Southern Industrial Peculiarities.—The industrial development of the South is attended with some very peculiar circumstances. In Alabama, more than in any other State, the inauguration of new industries has been in heavy mining and pig-iron making enterprises. Virginia, while following in the same line, shows a wider diversity of industries. Tennessee has been favored with several coal and iron enterprises that have helped largely to make up the aggregate amount for that State, but there has also been a remarkable number of small industries, such as machine shops, saw mills, wood-working and turning factories, established. Florida has made a decided advance, and the apparent fondness of North Carolinians for small enterprises is remarkable. There are more cotton mills in that State than in any other in the South, and yet, with few exceptions, they are small, as compared with Georgia and South Carolina mills, and so it is in other branches of manufactures. Factories are increasing by the dozen, but most of them are of moderate capacity.

The Railways of Europe.—The total length of European railroads at the end of 1883 was 113,577 miles, against 110,618 miles at the close of 1882, which shows an increase during the past year of 2859 miles. The length of the railroads of the various countries at the beginning of this year was as follows:

	Miles.
Germany	22,262.34
Great Britain and Ireland	18,710.98
France	18,406.56
Russia	15,568.82
Austria	12,927.00
Italy	5,860.86
Spain	5,115.62
Sweden and Norway	4,946.36
Belgium	2,646.78
Switzerland	1,706.24
Holland and Luxembourg	1,564.26
Denmark	1,116.00
Roumania	940.54
Portugal	926.28
Turkey, Bulgaria and Roumelia	864.28
Greece	13.64
Total	113,576.56

Excellent Virginia Ore.—The Wheatland Mine iron ore, No. 11 vein, as analyzed by J. B. Britton, of Philadelphia, is composed of the following ingredients:

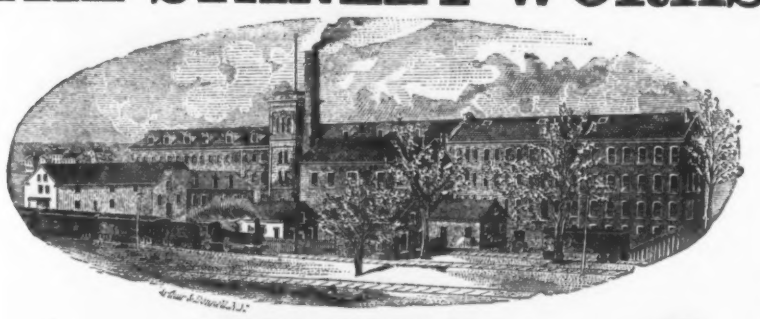
Metallic iron, pure	62.51
Oxygen with the iron	24.43
Silicious matter, insoluble	10.81
Water	0.73
Sulphur	None
Phosphorus	0.069
Alumina	0.69
Lime	0.06
Magnesia	0.03
Manganese oxide	Trace
Undetermined and loss	0.422
Total	100.000

These mines, near Riverville Station of the Richmond and Allegheny Railroad, Amherst County, Va., are now worked by Echols, Sherwood & Co., who, the *Virginias* says, are furnishing the Lynchburg Furnace about 60 tons daily of this high-grade specular ore.

A letter from St. Etienne, France, describes all the four industries of that town—coal mines, iron foundries, ribbon mills and armor-work—as being in a state of stagnation Within the last two years 25,000 workmen have left the town, and unless trade improves speedily 25,000 others will also have to leave, 50,000 out of the original total of 140,000 being thus thrown out of employment at St. Etienne. The budget of the town shows a deficit of 1,000,000 francs. The coal mines turn out 3,000,000 tons less than formerly. The metal works have lost the trade in rails, 60,000 tons of their former production of 300,000 tons having been given up. In the ribbon industry 30,000 hands are working either at reduced wages or not at all. On the whole, there are at present about 66,000 workpeople in the town; of those, 50,000 are working short time, 6000 full time, and 10,000 not at all.

The London and North Western Railway now includes four separate lines laid upon 114 miles, and three lines upon 28 miles, of its railway. The Midland Company have 66 miles of four lines and 21 of three lines. The Great Northern is laid with four lines for 24 miles and with three lines for 30 miles. There are now over 400 miles of railway in England laid with three or more sets of rails.

THE STANLEY WORKS



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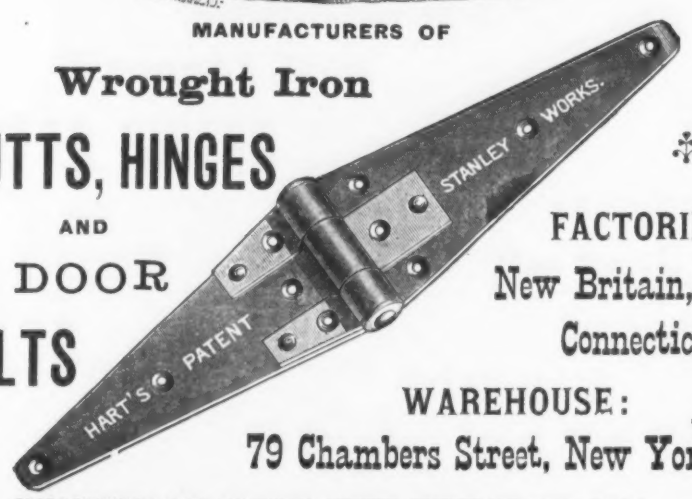

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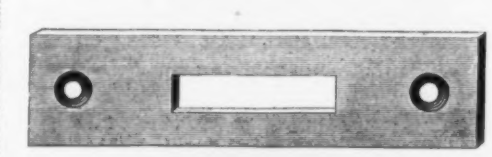

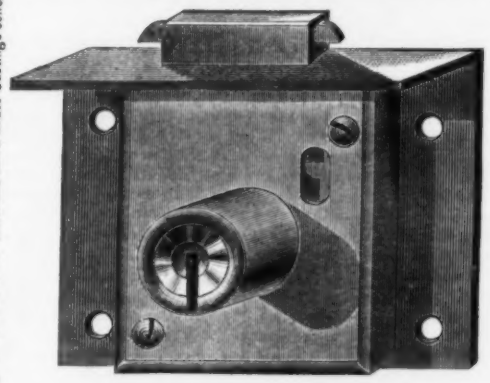

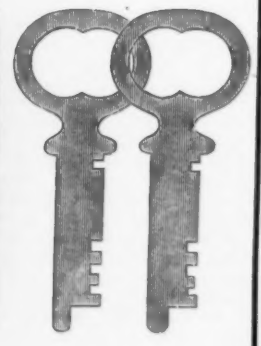

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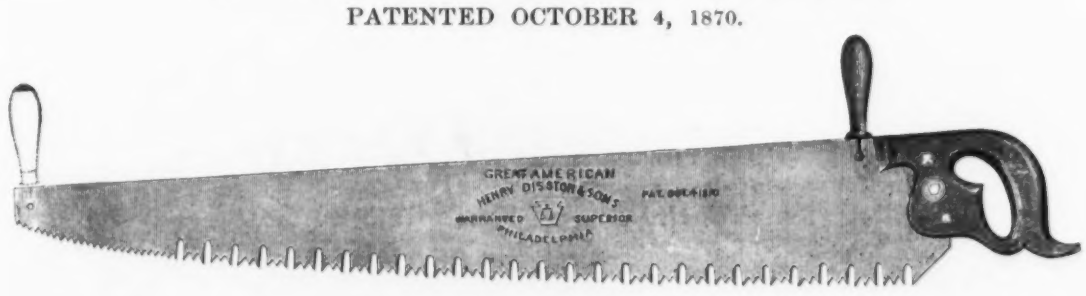
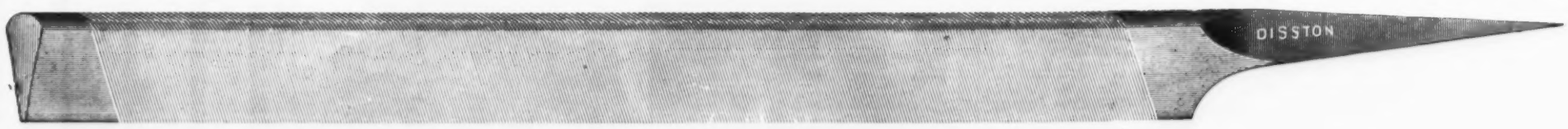


The above cut represents the GREAT AMERICAN ONE-MAN CROSS-CUT SAW with Supplementary Handle. This saw is made of the same steel and on the same principle as the celebrated No. 7 Hand-Saw.



We recommend the use of the GREAT AMERICAN CROSS-CUT FILE for keeping the teeth of the above saws in their exact shape in which they leave our works.

Fig. 1 shows the manner of filing the long edge of the end tooth.

Fig. 2 shows the manner of filing the short or inside edge of the end tooth.

Fig. 3 shows the section of the file in the guller of the saw.

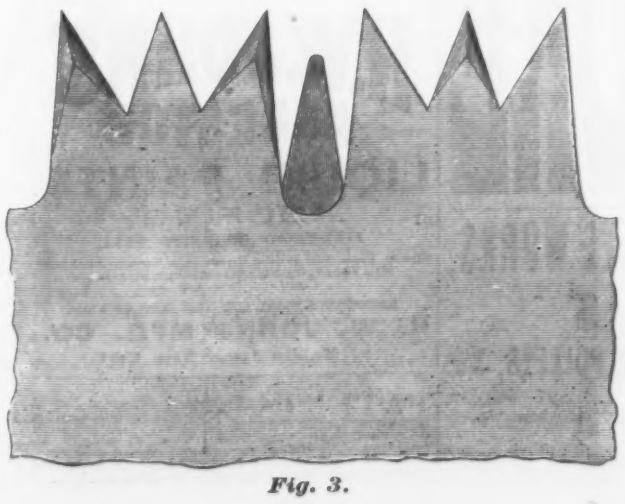


Fig. 3.

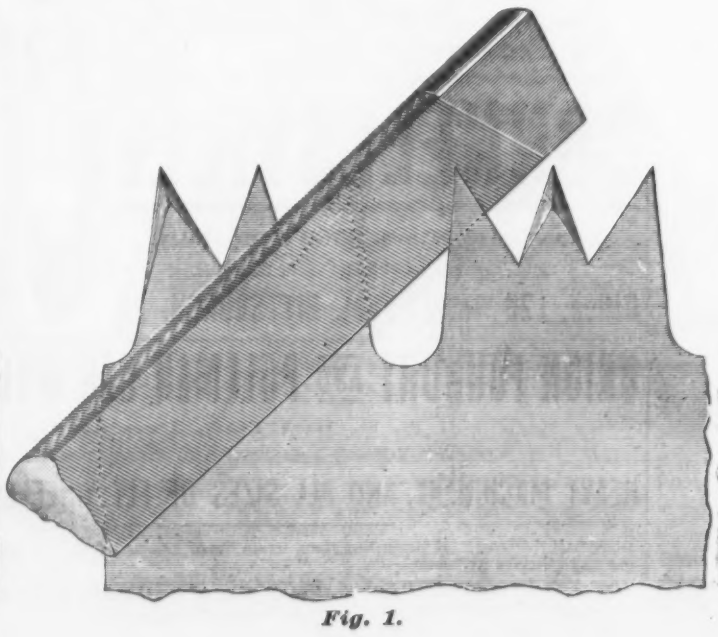


Fig. 1.

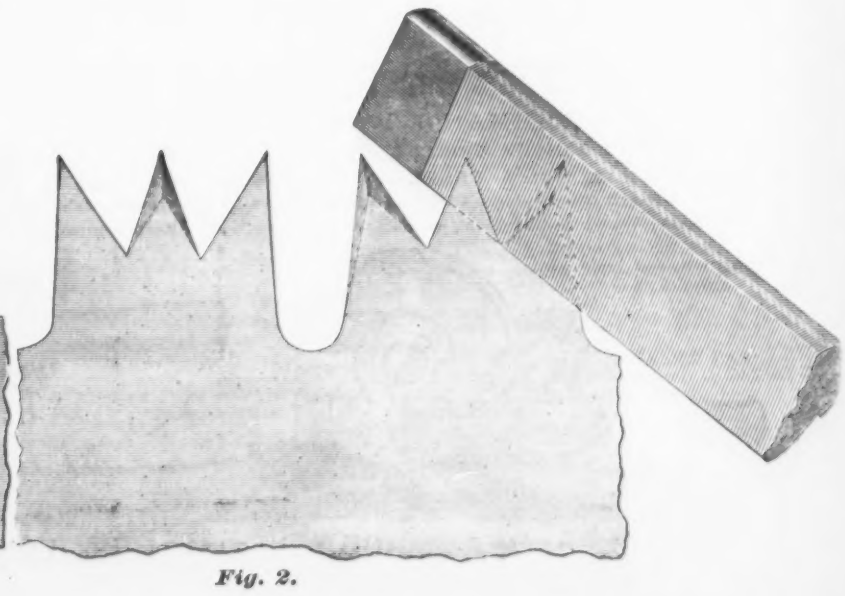


Fig. 2.

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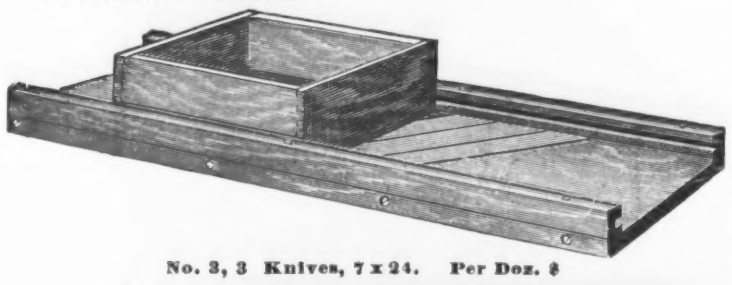
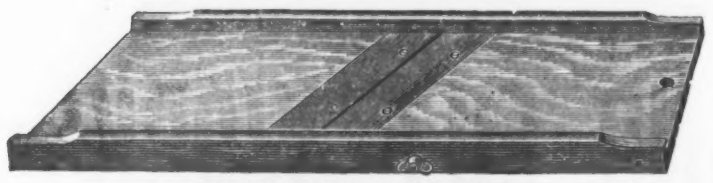
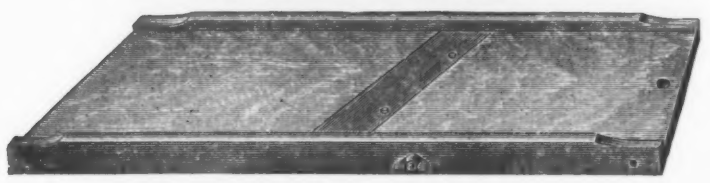


No. 3, 3 Knives, 7 x 24. Per Doz. $



No. 2, 2 Knives. Per Doz. $



No. 1, 1 Knife. Per Doz. $

SLAW CUTTERS.

1 knife, per gross. ..... $
2 knives, " ..... $

KRAUT CUTTERS.

No. 1. 1 knife, with box 8 x 26, per doz.
" 2, 2 knives, " " " "
" 3, 3 " " " "
" 4, 4 " " " "
" 5, 3 " " 9X30,
" 6, 2 " " 12X36, each.
" 7, 3 " " " "
" 8, 4 " " " "
" 9, 3 " " 12X30, "
" 10, 4 " " " "

Our Kraut and Slaw Cutters are made from well-seasoned cherry, and fully guaranteed to be first-class goods in every respect.

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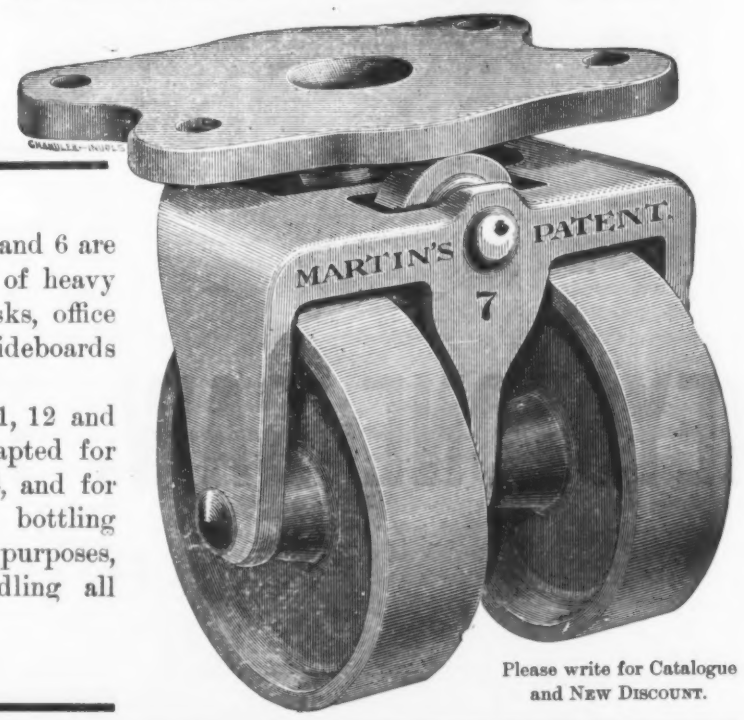

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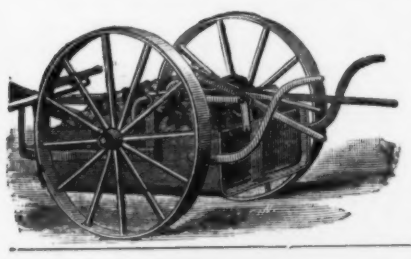

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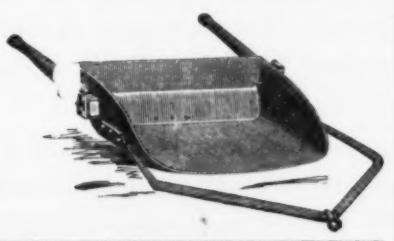

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THE HP NAIL CO.,

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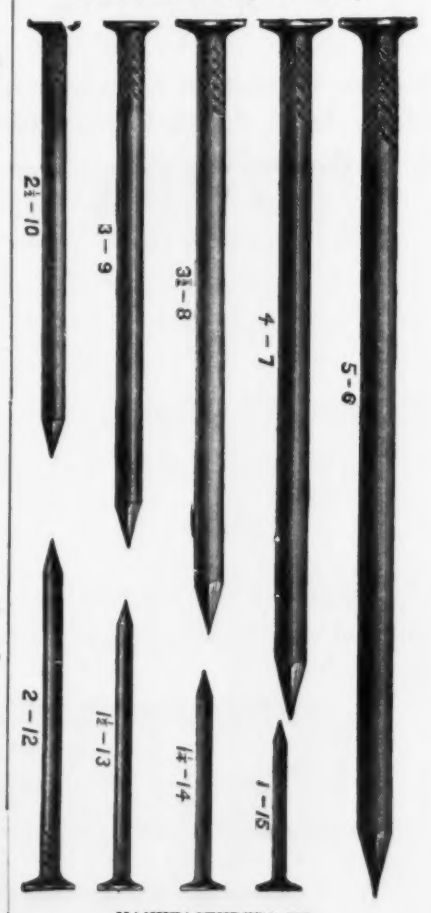

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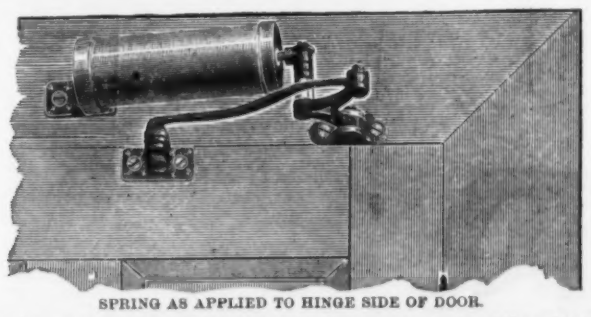

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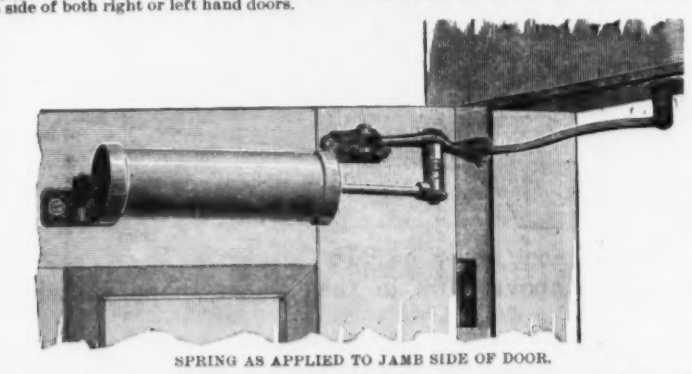

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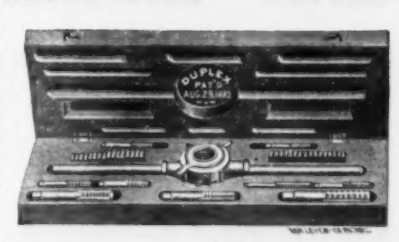

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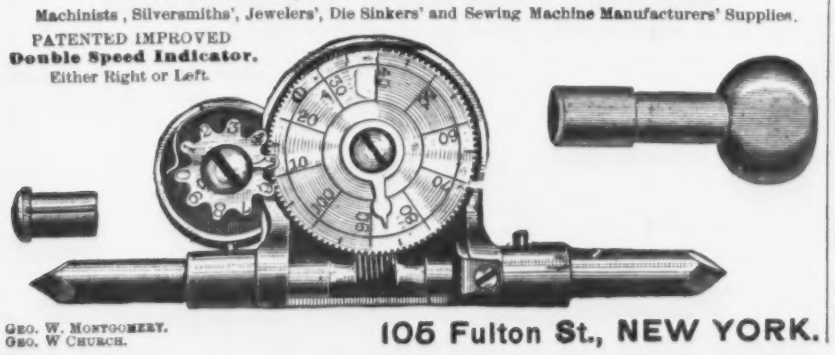

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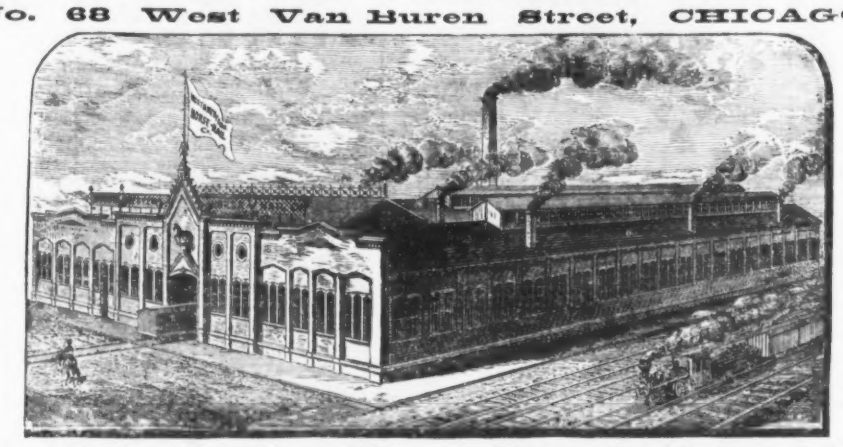

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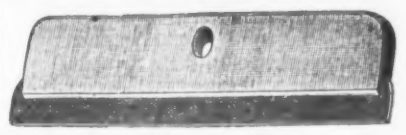

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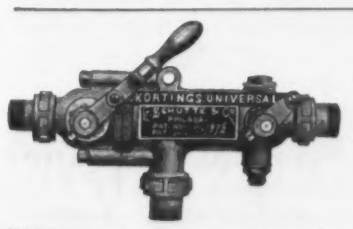

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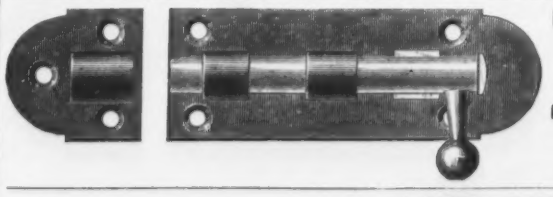

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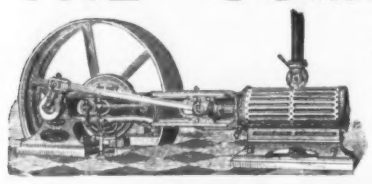

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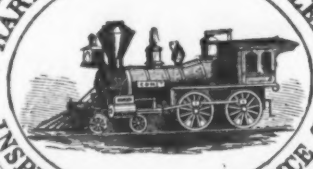

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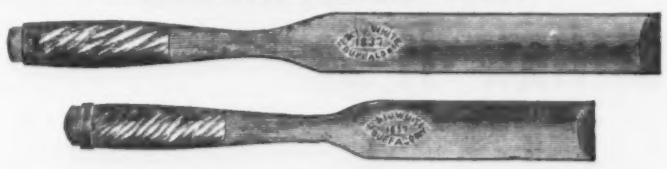

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ALSO MANUFACTURERS OF

Lead Pipe and Narrow Sheet Lead.

SALEM, MASS.

F. A. BROWN, Treas.

Excelsior

OIL LAMP & STOVE.

PRICE, $4.00.

SPECIAL PRICES TO THE TRADE ON APPLICATION.

This Wonderful Combination of LIGHT and HEAT is so constructed that it can be used as a Lamp, furnishing a powerful and pleasant light for reading, sewing, &c., and at the same time a POWERFUL HEAT, and will boil a quart of water in less than 10 minutes.

ALWAYS READY AND ECONOMICAL.

A Marvel of Convenience

STRONG, DURABLE AND ORNAMENTAL

For further information, address

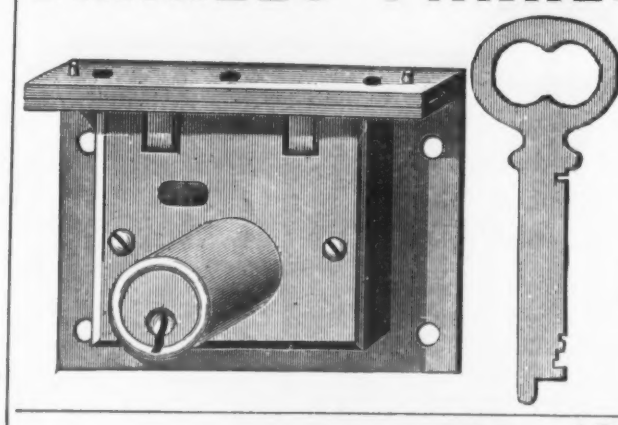
THE DANGLER VAPOR STOVE AND REFINING COMPANY,

Cleveland, - - - Ohio.

And 311 State St., CHICAGO, ILL.

THE

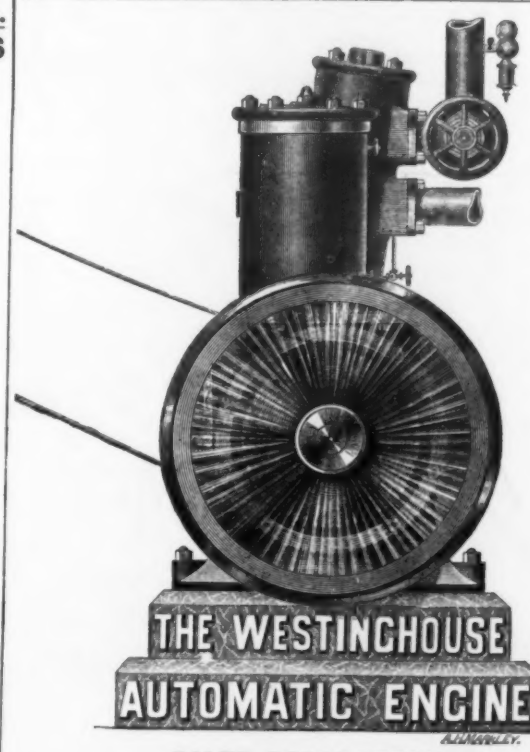
CHARLES PARKER CO.,



MERIDEN, CONN.,

Manufacturers of

CABINET LOCKS.



1000 Engines

NOW IN USE.

30,000 H.-P.

NOW RUNNING.

Sales 2000 H.-P.

PER MONTH.

Send for Illustrated Circular and Reference List.

The Westinghouse Machine Company,

PITTSBURGH, PA.

SALES DEPARTMENT CONDUCTED BY

WESTINGHOUSE, CHURCH, KERR & CO., 17 Cortlandt Street, New York.
FAIRBANKS, MORSE & CO., Chicago, Cincinnati, Cleveland, Louisville and St. Paul.
FAIRBANKS & CO., St. Louis, Indianapolis and Denver.
PARKE & LACY, San Francisco, and Portland, Oregon.
PARKE, LACY & CO., Salt Lake City, Utah.
IMRAY, HIRSCH & KAEPPEL, Sydney and Melbourne, Australia.

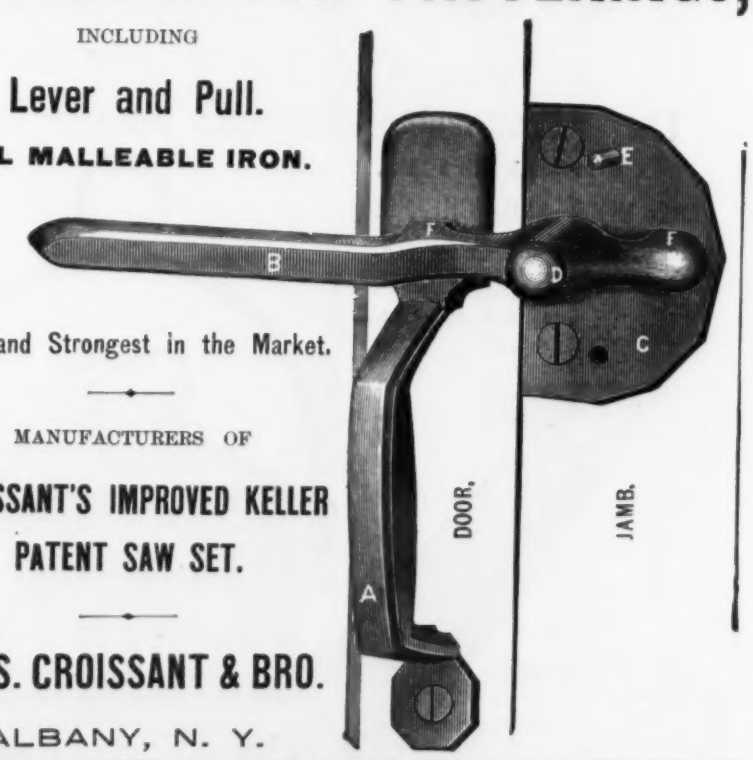
MAAS' PATENT

REFRIGERATOR FASTENINGS,

INCLUDING

Lever and Pull.

ALL MALLEABLE IRON.



Best and Strongest in the Market.

MANUFACTURERS OF

CROISSANT'S IMPROVED KELLER PATENT SAW SET.

CHAS. CROISSANT & BRO.

ALBANY, N. Y.

Bemis & Call Hardware & Tool Co.

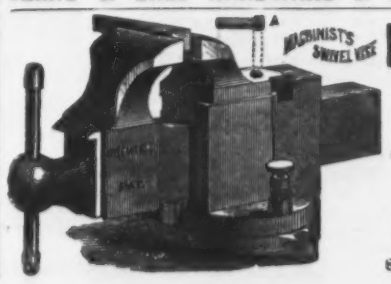
This Wrench can be furnished with Briggs' Pat. Nut or Sleeve

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.



PRENTISS' PAT. VISES,

Adjustable Jaw.

Stationary or Pat. Swivel Bottoms.

ADAPTED TO ALL KINDS OF VISE WORK. ALSO

"PEERLESS" SWIVEL PIPE GRIP,

FITS ANY VISE. SOLD BY THE TRADE.

PRENTISS VISE CO.,

93 Dey Street, New York.

SOLE PROPRIETORS. SEND FOR CIRCULAR

CRONK HANGER CO.,

ELMIRA, N. Y.

WROUGHT IRON SLIDE

BARN DOOR HANGERS

FOR WOOD TRACK.

PATENTED FEB. 13, 1883.

Can be operated by a child.

SPECIAL POINTS:

Simplicity, Durability, Strength and Finish.

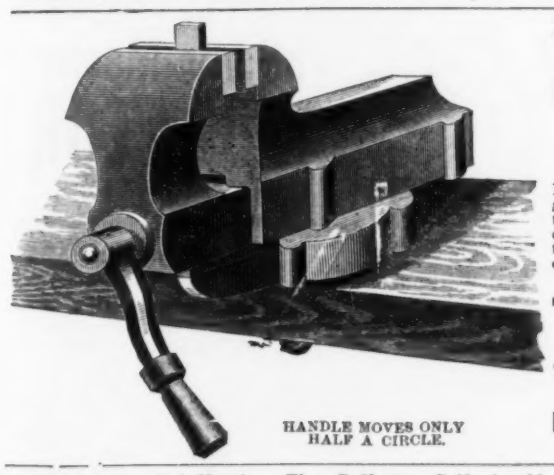
ADJUSTABLE

STAY ROLLER.

Send for sample dozen and circulars.

General Eastern and Southern Agent:

JOHN F. LOVEJOY, 102 CHAMBERS ST., *New York City.*



HANDLE MOVES ONLY HALF A CIRCLE.

MASSEY'S E. & K. PATENT

Iron and Wood Workers'

VISES.

Handle moves only half a circle. Loose jaw is slid to work, and grip given with less than half a turn of handle. Gripping parts coming into gear vertically give the strength desired for heavy chipping. Sold by the Trade. Send for descriptive circular.

T. C. MASSEY,

Sole Manufacturer,

11 to 23 S. Jefferson St., Chicago, Ill.

EASTERN DEPOT:

Link Belt Machinery Co.,

81 JOHN ST., NEW YORK.

Charles Kellogg. C. S. Maurice. Thos. C. Clarke. C. Macdonald. Geo. S. Field. Edmund Hayes.

UNION BRIDGE COMPANY,

Works: Athens, Pa. (Late Kellogg & Maurice.) Capacity, 14,000 tons.

Works: Buffalo, N. Y. (Late Central Bridge Works.) Capacity, 12,000 tons.

CIVIL ENGINEERS AND CONSTRUCTORS OF

Iron & Steel Bridges, Viaducts, Roofs,

ELEVATED RAILROADS. MARINE PIERS &c.

For Plans, Estimates and Tenders, address

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PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless Steel Shutters at Philadelphia 1876, Paris 1878, and Melbourne 1881.

CLARK, BUNNETT & CO., Limited,

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of

Noiseless, Self-Coiling, Revolving Steel Shutters.

Fire and Burglar Proof. Also, improved ROLLING WOOD SHUTTERS of various kinds, and Patent METALLIC VENETIAN BLINDS.

Office and Manufactory, - - 162 & 164 West 27th Street, New York.

LANE'S MEASURING FAUCET.

Price, $3.00.

For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY

LANE BROS., Poughkeepsie, N. Y.

General Agency, JOHN H. GRAHAM & CO., 113 Chambers St., New York.

RIPLEY MANUFACTURING CO.,

Unionville, Conn., U. S. A.

BEST PORCELAIN-LINED LEMON SQUEEZERS

"COMMON SENSE" MOUSE TRAPS, MALLETS, BOOT JACKS,

ROSEWOOD FAUCETS, &c. Fine Wood Turning a Specialty

THE HARTFORD HAMMER CO., Hartford, Conn.

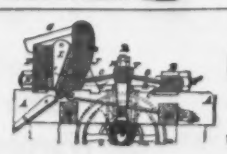
Manufacturers of Solid Cast Steel Hammers. All Hammers stamped "HARTFORD" are fully WARRANTED See first issue of each month

JOHN H. GRAHAM & CO., Sole Agents. 113 Chambers St. New York.

BLAKE

CRUSHER CO.,

New Haven, Conn.



BLAKE'S

Challenge Rock Breakers

Patented Nov. 18, 1879.

See *The Iron Age* first issue of the month.

STEVENS' CELEBRATED

SHOOTING GALLERY AND SPORTING RIFLES, HUNTERS' PET RIFLES, POCKET RIFLES, SINGLE AND DOUBLE BARREL SHOT GUNS.

Stevens' "PREMIER," or No. 7 and 8 Rifle.

24-INCH BARREL, 22, 32, 38 OR 44 CALIBRE, $29.

I have made many experiments with 22-calibre Rifles at from 25 to 200 yards, and must say the "STEVENS" has given me better results than any other make.
J. B. JONES, Pittsburgh, Pa.

Three Sights, Vernier, Globe and Open

POINTS OF EXCELLENCE:

REMARKABLE SHOOTING QUALITIES.
PORTABILITY.
DURABILITY.
SYMMETRY.
STRENGTH.

THE CONSTANTLY INCREASING DEMAND PROVES THEIR SUPERIORITY OVER ALL OTHER MAKES.

PRICE LIST OF RIFLES.

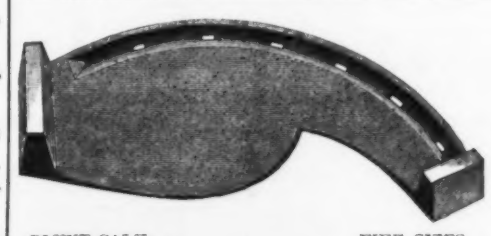
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.
24-inch....	$20.	$20.	$23.	$23.	$25.	$27.	$29.	$31.
26-inch ...	21.	22.	24.	25.	27.	29.	31.	33.
28-inch....	22.	24.	25.	27.	29.	31.	33	35.
30-inch....	23.	26.	26.	29.	31.	33.	35.	37.

LISTS AND DISCOUNT ON APPLICATION.

CHARLES FOLSOM, Sole Agent, 106 Chambers St., NEW YORK,

Or J. STEVENS & CO., P. O. Box 1819, CHICOPEE FALLS, MASS.

(No. 20.)



BLUNT CALK. FIVE SIZES.

SHARP CALK. FIVE SIZES.

MOUNT CARMEL

OX SHOES

—WITH—

STEEL TOE CALKS,

Finished Complete, Ready for Nailing On.

THE BEST AND CHEAPEST SHOE MADE.

WARRANTED TO OUTWEAR ANY OTHER SHOE.

FIVE SIZES EACH, SHARP AND BLUNT CALK.

WE ALSO MANUFACTURE

MILLER'S PATENT

FORGED OX SHOES,

From Burden's Iron.

Superior in many points to any other Forged Shoe made, and at as low price.

ALSO MANUFACTURERS OF AN EXTENSIVE LINE OF

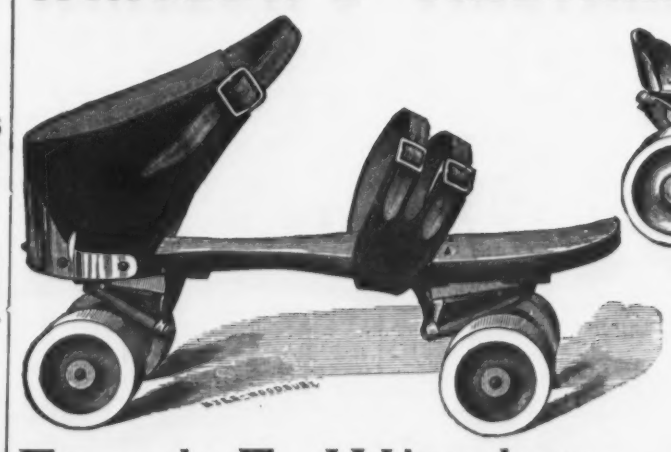
CARRIAGE HARDWARE AND FINE MOUNTINGS.

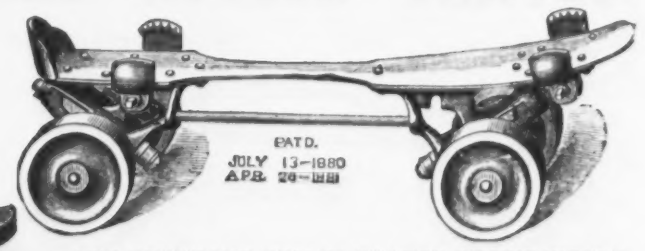
Correspondence Solicited.

WOODRUFF, MILLER & CO.,

MOUNT CARMEL, CONN., U. S. A.

WINSLOW'S VINEYARD ROLLER SKATES.





THE STANDARD ROLLER SKATES OF THE WORLD

These Skates are in use in over 2000 Rinks, and in every instance afford the fullest satisfaction. Address all orders and inquiries to

St. James Avenue and Clarendon Street,

BOSTON, MASS.

Frank E. Winslow,

PHILADELPHIA.

Lloyd & Supplee Hardware Co.

Term, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ⅌ ℔ ....10½ @ 10¾¢
Trenton ....9¾¢
Eagle Anvils, American, 10¢ ....dis. 20 %

Apple Parers.
Globe Apple Parers ....$5.50 net
Penn Apple Parers ....5.50 net
White Mountain 5.50
Lots of 10 to 25 dozen, special prices.

Axes.
Hunt's Kentucky and Yankee, ⅌ doz. net $7.00
Robert Mann, ⅌ doz. net 7.00
Richland Chief 7.00
Beveled Axes ....add 50¢
Double Bit Axes, net $12.00

Augers and Auger Bits.—New List, January 7, 1880.
Bates' Nut Augers ....dis 60 %
Cook's Augers ....dis. 50 %
Watrous' Ship Augers ....dis. 15 %
Benjamin Pierce Auger Bits ....dis. 40 %
New Haven Copper Company ....dis 60 %
Snell's Augers and Bits ....dis 60 %
Snell's Ship Augers ....dis 15 %
Cook's Auger Bits ....dis 50 %
Jennings' Auger Bits, new list Jan. 1, 1884..dis.. 25 %
Bonney's Pat. Hol. Augers, list $48 ⅌ doz.dis. 40&10 %
Stearns Pat. Hol. Augers, list $48 ⅌ doz...dis. 20&10 %

Balances.
Light and Common ....dis. 40&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells..dis. 75 @ 75 & 10 %
Swiss Pattern Hand Bells ....60 %
Connell's Door Bells ....dis. 15&10 %
Gt. Western & Kentucky Cow, new list ....dis. 70 %

Boring Machines
Upright, without Augers.....List, $5.50 } dis....50&5 %
Angular, without Augers....List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 ....dis. 75&12½ %
Philadelphia Carriage Bolts ....new list. dis. 75&10 %
Stanley, Wrought Shutter ....dis. 50, 10&10 %

Braces.—Barber's ....dis. 40&5 %
Backus ....dis. 50&5 %
Spofford ....dis. 50&5 %
American Ball ....dis. 55 %

Butts.—Cast Fast Joint, Narrow ....dis. 40&10&10 %
Cast Fast Joint, Broad ....dis. 40&10&10 %
Cast Loose Joint, Narrow ....dis. 60&10 %
Cast Loose Joint, Broad ....dis. 60&10 %
Cast Acorn, Loose Pin ....dis. 60&10 %
Cast Acorn, Japanned ....dis. 60&10 %
Cast Mayer's Loose Joint ....dis. 60&10 %
Wrought Loose Pin ....dis. 60&2½ @ 60&2½& 10 %
Wrought Table Hinges and Back Flaps..dis. 55&10 @ 55&10&10 %
Wrought Narrow Fast ....dis. 55&&10 @ 55&10&10 %
Wrought Loose Joint ....dis. 60&2½ @ 60&2½&10 %

Blind Butts.
Parker ....dis. 75&2 %
Clark ....dis. 75&10&2 %
Shepard ....dis. 75 %
Lull & Porter ....dis. 80&10 %
Huffer's ....dis. 50 %

Casters.—Bed (new list July 1, 1880) ....dis 50@55 %
Plate ....dis 50 @ 55 %

Chains.—German Halter and Coil, list June, 1884 ....dis. 50 @ 55 %
Galvanized Pump ....⅌ ℔ 7¢ net
Best Proof Coil Chain—English.

⅌ ℔	9¼	6¾	5¾	5	4¾	4½	
	3-16	¼	5-16	⅜	7-16	½	in.

Chisels.—Socket Framing ....dis 70&10 %
Socket Firmer ....dis 70&10 %
Butcher's ....$5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880) ....dis 40 @ 40&10 %
Enterprise ....dis 20&10 %

Cutlery.—Walden Pocket ....new list net
Pennsylvania Knife Co ....new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ....dis 70&10 %
Adjustable Handle ....dis 20 %

Fry Pans.
Tinned ....dis 45 %

⅌ doz...	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No......	0	1	2	3	4	5	6	7	8

Burnished ....dis. 60&10&10 %

⅌ doz....	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No..	0	1	2	3	4	5	6	7	8

Files.
Nicholson ....dis 60 %
Disston ....dis 60 %
Butcher ....

Fluting Machines.
Eagle—3½ in. roll ....each, $2.15 } dis 35 %
Eagle—5½ in. roll ....each, 2.85 }
Crown—4½ in. roll ....each, 3.50 }
Crown—6 in. roll ....each, 4.00 } dis 35 %
Crown—8 in. roll ....each, 6.50 }
Geneva Fluter ....dis 25 %
Favorite com. Fluter and Sad Iron..⅌ doz., $10.50 net

Hammers.
Yerkes & Plumb's, new list ....dis 40 %
Maydole Hammers ....dis 15 %
Howell A. E. Nail Hammers ....⅌ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut ....33¢ pair net
Boynton Loop Handles Cross-Cut ....33¢ pair net

Hatchets.
Yerkes & Plumb, new list ....dis 40&5 %
Hunt ....dis 35 %

Hinges.
Strap and T ....dis 60, 10, 10&2 @ 70 %

Horse Nails. Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5 %
Vulcan	26	23	21	20	19	18	dis 12½ %
Ausable	30	27	25	24	23	22	dis 25&10 %
Pol'ed and P't'd & Blued & P't'd.	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd.		24	22	21	20	19	dis 25&10 %
Saranac	26	23	21	20	19	18	..dis 20 %

Hay and Straw Knives.
Lightning ....⅌ doz., $18.00 dis. 10 %
Electric ....⅌ doz., 18.00 dis. 20 %
Wadsworth ....⅌ doz., net 10.50
Walton Straw Knives ....⅌ doz., net 17.00

Locks and Knobs.
Branford Locks ....60&2 %
Gaylord Cabinet ....dis 45&2 %
Parker's Cabinet ....dis 45&2 %
American Padlocks ....dis 45&2 % cash
Scandinavian Padlocks ....dis 50 %

⅌ doz..	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.....	57	58	59	60	61	62	63	}
⅌ doz			$18.00		26.00		33.00	} dis 60 %
No.			64		65		66	}

Lanterns.
Buckeye ....large list, net; small list, net
Tubular ....No. 0, $7.50; No. 1, $9.00 ⅌ doz. net
Guards, 40¢ extra.

Lawn Mowers.—Pennsylvania ....} new list,
Philadelphia ....} dis 30&5
Excelsior ....} &3 %

Lawn and Garden Pumps.
Holland Patent ....list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter ....new list, 50&10 %
Pennsylvania Pattern ....dis 50&10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.dis. 20&10 %
Stebbins' Gates ....dis. 70&10&2 %
Lincoln's Gates ....dis. 70&10 %
Landers, Frary & Clark's Petroleum ....dis 40&5 %
Brass Liquor Cocks, new list Jan. 1, 1880 ....dis. 60 %
Cork Lined Cocks ....dis. 70 %

Meat Cutters.
Dixon's ....dis. 40 %
Woodruff ....dis. 40 %
Stowe ....dis. 40 %
Hale's ....new list, dis. 60, 10&2 cash
American ....dis
Stuffers ....dis. 40 %
Enterprise Stuffers ....dis. 25 %

Planes.—Sandusky Tool Co ....dis. 20&10 %
Ogontz ....dis. 25&10 %
Ohio and Auburn ....dis. 20&10 %
Bailey (S. R. & L. Co.) ....dis. 20&10 %

Plane Irons.—Ohio Tool Co ....dis. 20&10 %
Butcher's ....$5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ....dis. 65&10&10 %
Stanley's Non-Adjustable ....dis. 65&10&10 %

Picks.—New list ....60 %

Razor Strops.
Lamont Combination ....⅌ doz. $4.00
Lamont Combination ....1 gross lots $42.00
Imitation Emerson ....⅌ doz. $2.00

Rules.—Stanley Boxwood ....dis. 75&10&10 %
Stanley Ivory ....dis. 55 %

Steelyards.—Hart's Pattern ....dis. 40 %

Per doz.....	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs	50	100	150	200	250	300

American Pattern ....dis. 40 %

Per doz......	$8.00	10.25	13.75	15.60	16.75	19.50
Lbs	50	100	150	200	250	300

Scale Beams ....55@60 %
Custers ....25 %

Squares.
Steel and Iron.dis. 50; full case..dis. 50&10&2 for cash
Try Squares, Stanley ....dis 55&10 %
Disston's Try Squares ....dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ....⅌ doz $9.00 }
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ....⅌ doz $8.50 } 30
Clipper No. 5, Painted Red, Boxed and Sharpened ....⅌ doz $8.00 }

Saws.—Disston's Hand, Panel and Rip ....dis 20&10 %
Disston's Circular ....dis 45&10 %
Cross-Cut No. 2, Plain Tooth ....dis 45&10 %
Cross-Cut Patent Tooth ....dis 45&10 %
Cross-Cut Champion Tooth ....dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list ....dis 17½ %
Griffiths ....dis 50 @ 50&10
Rowland ....dis 50 @ 50&10

Sad Irons.—4 to 10 ℔ ....⅌ ℔ 2¾ @ 3¢
Mrs. Potts' Patent ....dis 35 %

Stone.
Washita Extra ....⅌ ℔ 23½¢
Washita No. 1 ....⅌ ℔ 16¢
Washita No. 2 ....⅌ ℔ 13¢
Washita Slips ....⅌ ℔ 36¢
Washita Axe ....⅌ ℔ 13¢ net
Hindostan Oil Stone No. 1 ....⅌ ℔ 6¢ }
Hindostan Axe Stone ....⅌ ℔ 8¢ } dis 40 %
Hindostan Slips ....⅌ ℔ 10¢ }

Screws.
Flat Head Iron ....dis 75 %
Flat Head Brass ....dis 75 %
Round Head Brass ....dis 65 %
Round Head Iron ....dis 70 %

Spoons.
Plated ....dis 50&5&5 %
German Silver ....dis 40&5 %
Britannia, Boardman's ....dis 60 %
Britannia, Parker's ....dis 60&10 %
Tinned ....dis 10 %

Springs.—Torrey ....dis 50 %
Gem No. 3 small Japanned ....$2.00 } dis 50&10 %
Gem No. 2 medium Japanned ....2.75 }
Coil No. 10 ⅌ gross net $6.00
Other Standard Springs ....dis 50&10 %
Warner Door Springs, ⅌ doz. $2.50 ....dis 40 %
Standard Spring Hinges—
Single No. 0, ⅌ doz. net $1.25
Single No. 1, ⅌ doz. net 1.50
Other Standard Spring Hinges ....dis 25&10 %

Stocks and Dies. ....dis 10 and 5 %

Stove Polish.—Gem ....⅌ gross, $4.50, dis 5 %
Dixon ....6.00, dis 10 %
Fire Fly ....$3.00 gross, net

Tacks. ....dis 30&10 %
Shoe Nails—4-8, and over, 7¢ ....} 10 %
Shoe Nails—3½-8, and under, 8¢ ....}
Double Pointed Tacks ....dis 70&10 %

Traps.
Genuine Oneida—Newhouse ....dis 35 %
Im. Oneida—Newhouse list. First qual...dis 60&10 %

Vises.—Solid Box. Trenton new list ....dis 45 @ 50 %

Wrenches.—Agricultural ....dis 75 %
Coes' Genuine ....dis 60&3 %
Coes' Mechanics' ....dis 60&10&3 %
Coes' Mechanics.' Mall. Bar ....dis 70&15 %

Wire.
Bright or Annealed, No. 0 to 18 ....dis 67½ %
Bright or Annealed, No. 19 to 26 ....dis 70 %
Bright or Annealed, No. 27 to 36 ....dis 75 %
Coppered, 0 to 18 ....dis 62½ %
Tinned Broom Wire ....dis 62½ %
Galvanized Barb Wire ....7¼¢
Painted Barb Wire ....6¼¢
Galvanized. No. 7 to 18...Market List, dis 47½ @ 50 %

Wringers.
Peerless No. 2½ ....$30.00 }
Peerless No. 2 ....33.00 }
Universal No. 2½ ....30.00 }
Universal No. 2 ....33.00 } dozen lots $3.00 per dozen.
Novelty No. 2, for common tubs ....30.00 }
Novelty No. 3, " " ....34.50 }
Excelsior E, for stationary tubs ....39.00 }
Excelsior F " " ....43.50 }

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ⅌ cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.
1¼ to 4 by ⅜ to 1 inch ....2.5¢
4½ to 6 by ⅜ to 1 " ....2.6¢
1⅜ to 6 by 1⅛ to 1¼ " ....2.9¢
1¼ and 1⅜ by ¾ to ¾ " ....2.6¢
1 and 1⅛ by ⅜ to ⅝ " ....2.7¢
⅝, ¾ and ⅞ by ⅜ to ⅝ inch ....2.9¢

Rounds and Squares.
1 to 1⅞ ....2.5¢ | ⅝ to 9-16 ....2.7¢
2 to 2⅝ ....2.7¢ | ½ to 7-16 ....2.9¢
2¾ to 3¼ ....3.0¢ | ⅜ ....3.1¢
3⅜ to 4 ....3.5¢ | 5-16 ....3.3¢
4½ to 5 ....4.0¢ | ¼ ....3.5¢
⅝ to ⅞ ....2.6¢ | 3-16 ....5.5¢

Oval Iron.
⅞ to 1½ ....2.9¢ | ¾ ....3.3¢
⅝ to ¾ ....3.1¢ | ⅝ ....3.7¢

Half Oval and Half Round.
⅞ to 1⅜ inch ....3.2¢ | ½ inch ....4.0¢
⅝ to ¾ " ....3.7¢ | ⅜ " ....5.5¢

Horse Shoe.
⅝ to 1¼ by 5-16 to ⅝ inch ....3.5¢

Wagon Box Iron.
⅞ inch, Nos. 13 and 14 ....3.7¢
⅞ " " 11 and 12 ....3.5¢
¾ " " 13 and 14 ....4.0¢
¾ " " 11 and 12 ....3.8¢
⅝ " " 13 and 14 ....4.4¢
⅝ " " 11 and 12 ....4.1¢

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch ....2.7¢
1⅞ to 3¼ by ¼ and 5-16 " ....2.7¢
1 to 1⅜ by ¼ and 5-16 " ....2.8¢
¾ to ⅞ by ¼ and 5-16 " ....3.0¢
⅝ and ⅞ by ¼ and 5-16 " ....3.5¢

Light Bands.
1⅛ to 6 by ⅛ to 3-16 ....3.0¢
1⅛ to 6 by Nos. 11 and 12 ....3.1¢
1 to 1⅜ by ⅛ to 3-16 ....3.1¢
1 to 1⅜ by Nos. 11 and 12 ....3.2¢
⅞ and 13-16 by ⅛ to 3-16 ....3.4¢
⅞ and 13-16 by Nos. 11 and 12 ....3.5¢
¾ and 11-16 by ⅛ to 3-16 ....3.7¢
¾ and 11-16 by Nos. 11 and 12 ....3.8¢
⅝ and 9-16 by ⅛ to 3-16 ....4.0¢
⅝ and 9-16 by Nos. 11 and 12 ....4.1¢
½ inch by ⅛ and 3-16 ....4.3¢
½ inch by Nos. 11 and 12 ....4.4¢

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 ....3.3¢
1¼ to 2, Nos. 16, 17 and 18 ....3.4¢
1¼ to 2, No. 19 ....3.5¢
1¼ to 2, No. 20 ....3.6¢
1¼ to 2, No. 21 ....3.7¢
1¼ to 2, No. 22 ....3.8¢
15-16, 1, and 1⅛, Nos. 13, 14 and 15 ....3.5¢
15-16, 1, and 1⅛, Nos. 16, 17 and 18 ....3.6¢
15-16, 1, and 1⅛, Nos. 19 and 20 ....3.7¢
15-16, 1, and 1⅛, No. 21 ....3.8¢
15-16, 1, and 1⅛, No. 22 ....3.9¢
⅞, Nos. 13, 14 and 15 ....3.7¢
⅞, Nos. 16, 17 and 18 ....3.8¢
⅞, Nos. 19 and 20 ....3.9¢
⅞, No. 21 ....4.0¢
⅞, No. 22 ....4.1¢
13-16, Nos. 13, 14 and 15 ....3.9¢
13-16, Nos. 16, 17 and 18 ....4.0¢
13-16, Nos. 19 and 20 ....4.1¢
13-16, No. 21 ....4.2¢
13-16, No. 22 ....4.3¢
¾, Nos. 13, 14 and 15 ....4.0¢
¾, Nos. 16, 17 and 18 ....4.1¢
¾, Nos. 19 and 20 ....4.2¢
¾, No. 21 ....4.3¢
¾, No. 22 ....4.4¢
11-16, Nos. 13, 14 and 15 ....4.2¢
11-16, Nos. 16, 17 and 18 ....4.3¢
11-16, Nos. 19 and 20 ....4.4¢
11-16, No. 21 ....4.5¢
11-16, No. 22 ....4.6¢
⅝, Nos. 13, 14 and 15 ....4.4¢
⅝, Nos. 16, 17 and 18 ....4.5¢
⅝, Nos. 19 and 20 ....4.6¢
⅝, No. 21 ....4.7¢
⅝, No. 22 ....4.8¢
⅝, No. 23 ....4.9¢
9-16, Nos. 13, 14 and 15 ....4.6¢
9-16, Nos. 16, 17 and 18 ....4.7¢
9-16, Nos. 19 and 20 ....4.8¢
9-16, No. 21 ....4.9¢
9-16, No. 22 ....5.0¢
9-16, No. 23 ....5.1¢
½ inch, Nos. 13, 14 and 15 ....4.8¢
½ inch, Nos. 16, 17 and 18 ....4.9¢
½ inch, Nos. 19 and 20 ....5.1¢
½ inch, No. 21 ....5.2¢
½ inch, No. 22 ....5.3¢
½ inch, No. 23 ....5.4¢

The prices under Hoop Iron do not apply to Cotton Ties.

1-10¢ ⅌ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ⅌ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 ℔, ⅌ set of 6 hoops ....3.5¢
8 ℔ and less than 9 ℔, ⅌ set of 6 hoops ....3.6¢
Less than — ℔, ⅌ set of 6 hoops ....3.8¢

Extras for Cutting to Length all Preceding Iron,
All Iron, including Tire ....1.10¢

Tank Iron.
No. 9 and heavier ....3.3¢
Plow Slabs ....3.5¢
Plow Wings ....3.8¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.5¢	5.0¢	6.5¢
Nos. 15 to 17	3.8¢	5.3¢	6.8¢
Nos. 18 to 21	4.1¢	5.6¢	7.1¢
Nos. 22 to 24	4.3¢	5.8¢	7.3¢
Nos. 25 and 26	4.5¢	6.0¢	7.5¢
No. 27	4.7¢	6.2¢	7.7¢
No. 28	5.1¢	6.6¢	8.1¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.
1st quality (A) ....10½¢ | 2d quality (B) ....9.0¢

Galvanized C. H. B.—(Charcoal Hammered Blooms.)
Nos. 14 to 20 ....12¢ | No. 27 ....15¢
Nos. 21 to 24 ....13¢ | No. 28 ....16¢
Nos. 25 and 26 ....14¢ | No. 29 ....18¢
50 @ 52½ % discount.

Coal Screen Iron.
1⅛ by ⅝ by 5-16 ....3.0¢ | 1 by ⅝ by 5-16 ....3.5¢

Angle Iron.
2½, 3, 3½ and 4 inch ....3.3¢
1½, 1¾, 2 and 2¼ " ....3.3¢
1¼ inch ....3.4¢
1 " ....3.6¢
1⅛ by 1 inch, for Plow Handles ....3.8¢
1⅛ by ¾ " " " ....3.8¢
1⅜ by ¾ " " " ....3.9¢

T Rail.
8 lbs. to the yard ....2.9¢ | 20 lbs. to the yard ....2.8¢
12 " " ....2.8¢ | 28 " " ....2.8¢
16 " " ....2.8¢ | 30 " " ....2.8¢
Splice Joints for 12, 16 and 20℔. Rail, 40¢ each; 28 and 30-℔. Rail, 50¢ each; 40-℔., 60¢ each.
3½ by ⅝ and ½ Spikes for 20 and 28-℔. Rail ....3¾¢
2½ and 3 by ⅜ " " 12 and 16-℔. " ....4.0¢
2½ by 5-16 " " 8-℔. Rail ....4½¢

Flat Rails.—Punched and Countersunk.
1⅛ to 2 by ¼ to ⅝ inch ....3.0¢
1⅛ by ⅝ and 7-16 inch ....3.2¢
1⅛ by ⅜, 7-16 and ⅛ inch ....3.5¢

Juniata Nail Rods ....6.5¢
Norway Nail Rods ....8.0¢
Guard Iron, ⅛x⅝x⅝ and ⅛x⅝x⅝ ....4.0¢
Guard Iron ⅜x⅝x9-16 and ⅛x⅝x½ ....4.2¢
Drag Bars ....3.3¢
Dropper Bars ....3.8¢
Cylinder and Landside Iron ....3.2¢
Plow Beam Iron ....3.0¢

Nails.
See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.
⅝ to 2 inches, inclusive ....9½¢
1-16 and 2⅛ to 3 inches ....10½¢
¼ and 3⅛ to 4 " ....11½¢
7-32 and 4⅛ to 5 " ....12½¢
3-16 and 5⅛ to 6 " ....15½¢
5-32 inch ....20½¢
⅛ " ....25¢
Oil Well Steel Forgings ....20¢

Machinery Steel.

	Crucible	Bessemer & Open Hearth.
Ordinary Sizes, ⅜ to 2 inch Round	5¢	3½¢
5-16 and 2⅛ to 3 inches	6¢	4½¢
¼ and 3⅛ to 6 "	7¢	5½¢
7-32 inch	9¢	7¢
3-16 "	11c	9¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.
Crucible Cast Steel ....6¢
Open Hearth Cast Steel ....5¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	11¢	10¢	8¢	½¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.
Auger and Auger Bit ....5¢
Axle Steel for carriages and wagons ....5¢
Frog Points and Plates ....6¢
Frog Side Bars ....5¢
Pick, plain (hammered) ....6¢
Pick and Mattock, beveled (rolled ....5¢
Skate Steel ....6¢
Table Cutlery, plain ....5¢
Table Cutlery, beveled ....6¢
Pike and Cant Hook ....7¢
Coal and Granite Wedge ....7¢
Roller ....7¢
Spindle, subject to Machinery classification ....6¢
Trap Spring Steel ....8¢
Forged Crank Pins and Lathe Spindles ....7½¢
Piston Rods, plain ....5¢
Piston Rods, forged to shapes ....7½¢
Slide Bars, plain 6c
Slide Bars, forged to shapes ....7½¢

Open Hearth or Bessemer
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ....4¾¢
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ....6¢
Circulars and semi-circulars, when ordered separately 7c
Smoke Stack, to shape ....6¢
Locomotive Tank Steel ....5¢

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8-inch and over ....5¢
Mill Saw, 8-inch and over ....6¢
Taper, 3½-inch and over ....7¢
Horse and Shoe Rasp ....6¢

Spring Cast Steel. ....5¢
Spiral, Taper, cut to lengths ....6¢

Tire Cast Steel.
1x¼ and over ....7¢
1x3-16, ⅞x3-16 and ¼ ....7½¢
1 and 13-16x⅛ and 5-32, ¾x3-16 and 5-32 ....9½¢
¾ and ⅝x⅛ and 3-32 and 12 g ....10¢
Solid Safe Cast Steel ....6¢
Three and Five Ply Cast Steel ....8¢

Agricultural Implement Cast Steel.
Fork and Rake, Crucible ....5¢
Horse Rake Steel, cut to lengths, Crucible ....6¢
Hoe, Crucible ....6¢
Corn Stalk Cutter, beveled ....5¢
Beveled Hoe and Shovel Steel in Bars ....5¢
Crucible Plow Steel in Slabs ....5¢

Bessemer and Open Hearth.
Spring ....3½¢
Spring spiral and taper, cut to lengths ....4¢
Tire, 2-16 thick and above ....3½¢
Toe Calk ....3½¢
Plow ....3½¢
Axle Billets ....3½¢
Sleigh Shoe ....3½¢
Cutter Shoe, cut to lengths and tapered ....4½¢
Scythe Back Steel ....4¢
Grain Drill Bars ....4¢
Grain Drill Points ....5¢
Rolling Coulter Blanks, cut and punched ....9½¢
Thrasher Steel ....4¢
Thrasher Teeth ....5½¢
Rolled Hammer Billets ....4¢

Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace Floor and Straightening Plates ....1½¢
Housings and Castings not otherwise specified ....2½¢
Guide Plates ....3¢
Spindles and Coupling Boxes ....2¢
Sand Rolls and Pinions, large size ....2½¢
Sand Rolls and Pinions, small size ....3 ¢
Pipe Mill Castings ....5 ¢
Rolling Mill Castings under 50 ℔ ....4 ¢
Spur and Bevel Wheels, large ....4 ¢
Spur and Bevel Wheels, small ....4½¢
Pulleys up to 30 inches ....4½¢
Pulleys over 30 inches ....4 ¢
Engine Castings, light ....4½¢
Engine Castings, heavy ....4 ¢

Chilled Rolls.
6 to in. diam., to 20 in. long ....4 ¢
8 to 15 in. diam., 8 to 40 in. long ....4 ¢
25 to 24 in. diam., 15 to 72 in. long ....3½¢
14 to 31 in. diam., 72 to 108 in. long ....3½¢

After October 1, 1881, no discounts will be made at settlement, as heretofore, prices quoted being net.

White and Red Lead.
Strictly Pure White Lead in Oil in kegs, 6¼¢; in 25 ℔ Tin Pails, ½¢ ⅌ ℔ over keg price; 12½ ℔ Tin Pails, 1¢ ⅌ ℔ over keg price; assorted, 1 to 5 ℔ cans, 3¢ ⅌ ℔ over keg price.
Dry White Lead in barrels ....6½¢
Red Lead, very brilliant, in kegs and barrels ....6¢
Litharge (Potter's Lead) " " " ....6¢

Freights equalized with all points where White Lead is made.

Terms: Note at 60 days, or if paid within 15 days from date of invoice a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.
Discount, 60&10 % on Single Strength, 60&20 % on Double.
Prices current, ⅌ box of 50 feet.

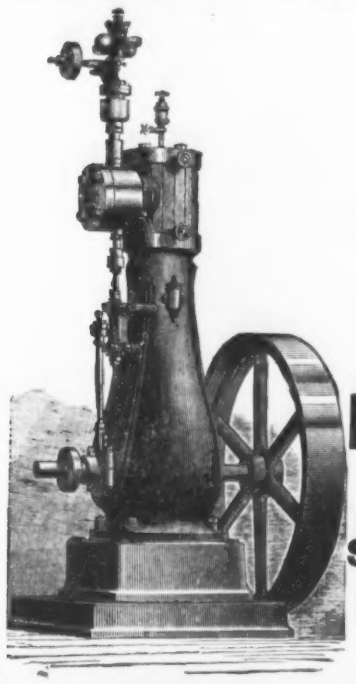
Single Strength.

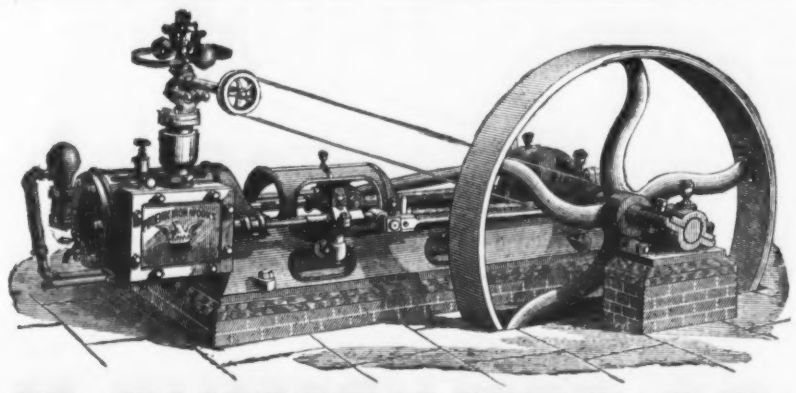
United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	.
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	..
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	...	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
100	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ⅌ box extra for every 5 inches.

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.
Axes, Single Bit, Lippincott ....per doz., $7.25
Axes, Single Bit, James & Co ....per doz., 6.75
Axes, Double Bit, Lippincott ....per doz., $13.00
Axes, Double Bit, James & Co ....per doz., 10.00
Drain Tools, list ....dis 20 %
Hoes, Planters' ....dis 60 %
Hoes, Scovill Pattern ....dis 60 %
Hoes, Handled, Square Eye, German ....dis 50 %
Handles, Cross Cut ....per doz., $2.50
Handles, Shovel, Bent, Bored, Riveted..per doz., 2.25
Saws, Circular ....dis 45 %
Saws, Long ....dis 40 %
Saws, Cross-Cut, H. B. & Co., Champion, per foot net $0.30
Saws, Cross-Cut, Lippincott, Champion, per foot net $0.27
Shovels, list ....dis 20 %
Spades, list ....dis 20 %
Scoops, list ....dis 20 %





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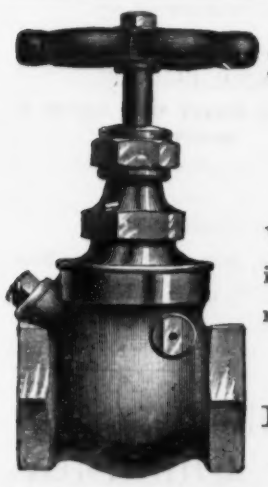

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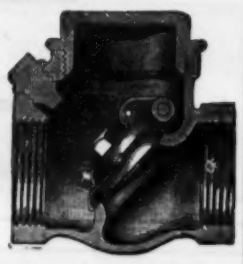

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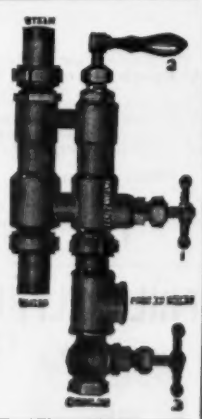

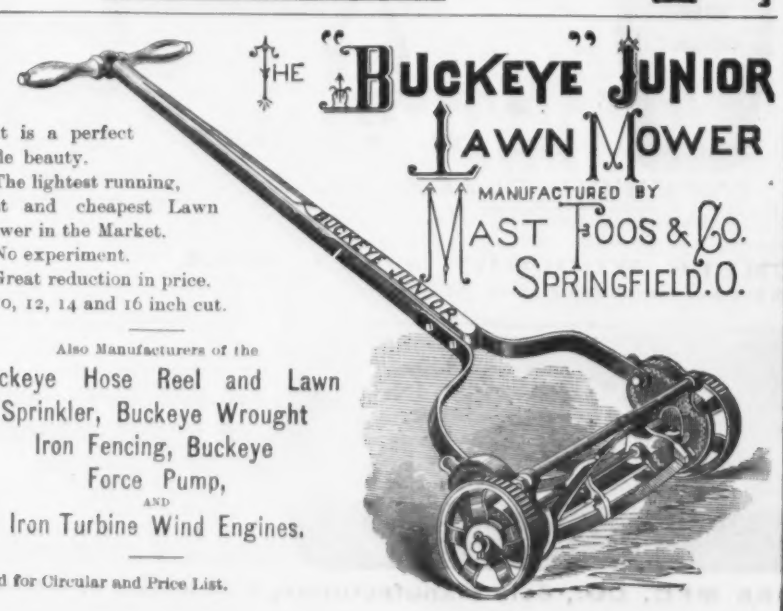

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The lightest running, best and cheapest Lawn Mower in the Market.
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10, 12, 14 and 16 inch cut.

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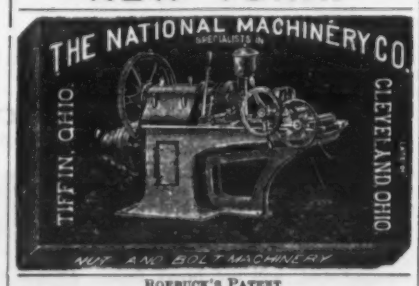

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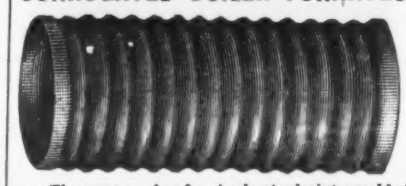

1. They are made of a single steel plate, welded at the bottom, with no joint in contact with the flame.

2. They give 50 per cent. more evaporative power.

3. They throw off all scale by their elasticity.

4. They do not destroy themselves by the variation of temperature, contracting and expanding as they do like an accordeon. They have not enough stiffness to work against the boiler heads.

5. They require, to comply with the rules of the Board of Trade in England, only *one-half* the thickness of plate of plain furnaces for equal working pressure.

6. Where a plain furnace of equal length, diameter and thickness collapsed at 225 pounds, the Corrugated stood 1020 pounds per square inch.

Since five years 700 steamers were fitted with these furnaces, among them the Alaska, Oregon, City of Rome, Servia, Elbe, Werra, Fulda, &c.

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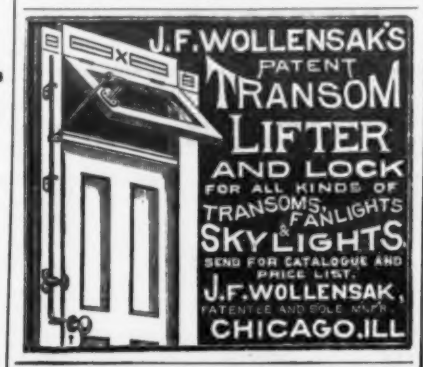

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No. 1, $0.25; 2, $4.25; 3, $3.50 each ..... dis 25 %

Augers & Bitts.—
L'Hommedieu's Ship Auger ..... dis 15 %
Jenning's Bitts ..... dis 25 %
Cook's Bitts ..... dis 40 & 10 %
Shepardson's Double-Cut Bitts ..... dis 45 %
Shepardson's Double Gimlets ..... dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ doz., $48; No. 3, ₱ doz., $60 list ..... dis 20 %
Bonney's Extension Hollow Augers ..... ₱ doz $36.00
Pierce's Bitts ..... dis 50 %
Griswold Bitts ..... dis 60 %

Axes.—Blue Jackets ..... ₱ doz $7.50
Dowse Handled Boys' ..... dis 35 %

Ax Handles.—
Oak Extra, 31 in., No. A ..... ₱ doz $2.50
Oak Extra, 34 in., No. A ..... ₱ doz 2.50
Oak Extra, 31 in., No. B ..... ₱ doz 2.00
Oak Extra, 34 in., No. B ..... ₱ doz 2.00
Oak Extra, 31 or 34 in., No. C ..... ₱ doz 1.40

Axle Clips ..... dis 50 %

Balances.—Chatillon's ..... dis 40 %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers) ..... ₱ ft., 2¢
Cast Half Round ..... ₱ ft., ¾, 3¢; 1⅛, 4¢
Wrought Round ..... ₱ ft., ¾, 3¢; ⅞, 4¢; 1⅛, 5¢

Bells.—Connel's Crank Gong, reduced list.. dis 15&10 %

Bird Cages.
Japanned M. B. & D., reduced list, 1879 ..... dis 40 %
Brass M. B. & D. reduced list, 1879 ..... dis 33⅓ %

Blind Fasts.
No. 6 Fasts ..... ₱ C sets 6.00
Vesrie Fasts ..... ₱ C sets 6.00
Shedd's ..... ₱ C sets 6.50

Blind Hinges.—Mall. Hook, 3 holes.. ₱ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable ..... ₱ doz $2.00

Bolts.—Norway Iron Carriage ..... dis 75 %
Common Carriage ..... dis 80&20 %
Eagle Carriage ..... dis 75 %

Borax.—Refined ..... ₱ ℔ 12¢

Boring Machines.—
Eagle Upright, each ..... $5.50 list } dis 50 %
Eagle Angle, each ..... 6.75 list }

Braces.—Barber's ..... dis 40&5 %
Spofford's ..... dis 50&5 %
Backus's ..... dis 50&5 %

Bracket Saws.—Holly Scroll Saw ..... each $2.25
Bracket Saws, extra quality, to No. 5 ..... ₱ gro. 0.75
Steel Frame, with patterns ..... ₱ doz 6.50
Lester ..... dis 20 %
New Rogers, all iron ..... dis 25 %

Bracket Saw Blades.—Grimth's pat., ₱ gross 75¢

Brackets.
H. B. & M. Flower Pot, reduced list ..... dis 1⅛&10 %
Bronzed Shelf, M. B. & D., new list ..... dis 50&10 %
Store Shelf ..... dis 40&10 %

Butts.—Union Fast Joint ..... dis 40&10&10 %
Union Loose Joints ..... dis 60&10 %
Union Japanned Acorn ..... dis 60&10 %
Union Silvered Acorn ..... dis 60&10 %
Union Boston Finish ..... dis 70&10 %
Union Spiral Spring ..... dis 25&10 %
Wrought Brass ..... dis 75&10 %

Carriage Bolts.—Eagle Norway ..... dis 75 %
Common ..... dis 80&20 %

Carriage Jacks.—Climax No. 1 ..... ₱ doz $20.00
Climax No. 1½ ..... ₱ doz 15.00
Climax No. 2 ..... ₱ doz 13.50
Universal ..... dis 25 %
Universal No. 1 ..... each $2.00
Universal No. 2 ..... each 3.00
Universal No. 3 ..... each 6.00
Universal No. 4 ..... each 6.00
Universal No. 5 ..... each 6.50

Cartridges.—U. S. Cartridge Co. ..... dis 50&10 %

Cards.
Watson's make Horse & Curry ..... dis 10 % } Rev. List.
Watson's Cotton ..... dis 10 % } Aug., 1883.
Watson's Wool ..... dis 10 % }

Casters.—Bed and Table ..... dis 50&10 %

Chain.
Coil 3-16 ..... ₱ ℔ 10¢
Coil ¼ ..... ₱ ℔ 7½¢
Coil 5-16 ..... ₱ ℔ 6½¢
Coil ⅜ ..... ₱ ℔ 6½¢
Coil 7-16 ..... ₱ ℔ ¢
Coil ½ ..... ₱ ℔ 5¢

Chalk.—White, Carpenter's ..... ₱ gross 60¢
Red, Carpenter's ..... ₱ gross 80¢
Blue, Carpenter's ..... ₱ gross $1.00
Crayons ..... 12¢

Chisels.—Peck, Stow & Wilcox ..... dis 60&10&10 %
Underhill, Framing ..... dis 35 %
Buck's Chisels ..... dis 30 %

Coal Hods.—"Dover."—Galv'd, New List.. dis 60 %
Japanned, New List ..... dis 60 %

Cocks.—Brass. L. F. & Co. ..... dis 50&10 %

Coffee Mills.—New List ..... dis 40 %

Copper Rivets.— ..... dis 50 %

Cordage.—Manila, usual trade dis 1¢ ..... ₱ ℔ 15½¢
Jute ..... ₱ ℔ 8¢

Cow Ties. ..... dis 50 %
No. 30 3 ft. No. 6 Wire, with toggle ..... ₱ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap ..... ₱ doz 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle ..... ₱ doz 4.30
No. 45, 3½ ft. No. 6 Wire, with snap ..... ₱ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle ..... ₱ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap ..... ₱ doz 5.00
No. 60, 4¼ ft. No. 3 Wire, with toggle ..... ₱ doz 5.60
No. 65, 4½ ft. No. 3 Wire, with snap ..... ₱ doz 5.80

Crow Bars.—Cast Steel ..... ₱ ℔ 7¢
Iron Steel-pointed ..... ₱ ℔ 6¢

Cutlery.—Pocket American Shear Co.'s ..... dis 40
Butcher Knives, Wood's, Lap Bolster, Square Handle ..... dis 40 %
Steak Knives ..... dis 40 %
Lap Bolster, Oval Handle ..... dis 40 %
Sticking ..... dis 40 %
Skinning ..... dis 40 %
Butcher, Common Round Handle, Wood's ..... dis 40 %
Shoe Knives, Wood's ..... dis 30 %

Dividers.—Cook's ..... dis 25 %

Dog Collars. ..... dis 20 %

Door Springs.—Tor Rod ..... ₱ doz $1.62
Imitation Torrey's Rod ..... ₱ doz 1.45
Gem Coil, new list ..... dis 50&10 %
Crown ..... ₱ doz $1.25
Warner's ..... ₱ doz 2.00

Door Stops.—Thurston's ..... dis 50 %

Drawer Knobs.—Thurston's ..... dis 50 %

Drills.—Morse Bitt Stock } dis 40 %
Morse Straight Shank }

Emery.—Wellington Mills ..... ₱ ℔ 10¢
Walpole Emery Mills ..... ₱ ℔ 5¢
Turkish, in 10 ℔ cans ..... ₱ ℔ 7¢

Enameled Ware.—
Standard Mfg. Co. Kettles ..... dis 60 %
Standard Sauce Pans ..... dis 30 %

Felloe Plates.—Wrought ..... ₱ ℔ ¢

Files.—American File Co. ..... dis 50 %
Nicholson File Co. ..... dis 50 %

Fluting Machines.—Knox List, $4.00. ..... dis 25 %

Forks.—W. C. & Co. Manure ..... dis 50 %
Eastern Tool Co.'s. Manure ..... dis 60 %

Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32 ..... ₱ doz $1.00
Pierce's ..... ₱ doz .88

Glass Cutters.—Combination Glass Cutter and Knife Sharpener ..... ₱ doz $1.00

Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₱ doz. dis 50 & 10 %

Hammers.—Maydole's ..... dis 15 %
Hartford Hammer Co ..... dis 20 %

Hangers & Rollers.—Anti-Friction. ..... dis 50 %
Acme Rollers ..... dis 50 %
Climax ..... dis 50 %
Common Hangers ..... dis 50 %
Common Rollers ..... dis 50 %
Victor Hangers ..... dis 33⅓ %
Victor Rail ..... dis 40&10 %

Hand Screws. ..... dis 10 %

Hatchets.—C. F. Dowse, new list ..... dis 35 %
Underhill ..... dis 35 %

Hay Knives.—Lightning ..... ₱ doz $18.00, net

Hinges.—Strap and T (new list) ..... dis 60&10 %
Providence Plate ..... ₱ ℔ 5¢
Wrought Screw Hook ..... ₱ ℔ 5¢

Hoes.—Eastern Tool Co. ..... dis 60&10 %
W. C. & Co.'s ..... dis 60 %

Hooks and Staples.—Brewers (new list)... dis 60 %

Horse Nails.

	No. 6	7	8	9	
Putnam Pointed	.24	.22	.21	.20	5&7 %
Bridgewater	.21	.19	.18	.17	30 %

Ice Cream Freezers.—Packer's, new list. dis 50&5 %

Knobs.—"Norwalk." New list ..... dis 60&2 %
Silver Glass ..... dis 50&10 %
Silver Glass Bell Pulls ..... dis 50&10 %

Lanterns.—Tubulars, No. 0 ..... ₱ doz $7.50

Lawn Mowers.
Continental ..... dis 40&10 %
Quaker City ..... dis 40&5 %
National ..... dis 50 %

Lead.—Sheet ..... ₱ ℔ 6½¢
Pipe ..... ₱ ℔ 5¾¢

Locks.—Norwalk ..... dis 60&2 %
Eagle Cabinet ..... dis 45 %
Eagle Trunk ..... dis 15 %
W. Wilcox & Co., Padlocks ..... dis 45 %

Manure Forks.—W. O. & Co. ..... dis 50 %
Eastern Tool Co.'s ..... dis 60 %

Mattocks.
K. P. & Co., Long Cutter, $16.00 ₱ doz. ... dis 50 & 10 %
K. P. & Co., Short Cutter, $15.50 ₱ doz. .. dis 50 & 10 %
K. P. & Co., Pick Cutter, $16.00 ₱ doz .... dis 50 & 10 %

Measuring Tapes.—Eddy's ..... dis 20 %

Meat Cutters.—Miles' Challenge ..... dis 30 %
Hale's (new list) ..... dis 40&10 %
American ..... dis 33⅓ %

Money Drawers.—Tucker's Alarm.... ₱ doz $22.50

Mouse Traps.—Delusion ..... ₱ doz 1.25
Novelty ..... ₱ doz

Nails. ..... ₱ keg

Oilers.—Zinc and Tin ..... dis 60 %
Brass and Copper ..... dis 50 %

Ox Bows.—Extra finished and varnished.... dis 15 %
1¼ in., ₱ doz. pair... $7.00 | 2 in., ₱ doz. pair.. $10.00
1⅝ in., ₱ doz. pair... 9.00 | 2½ in., ₱ doz. pair.. 12.00

Paper.—Common Tarred Sheathing ..... ₱ ℔ 1½¢
Eagle Brand Tarred Sheathing ..... ₱ ℔ 2 ¢
Common, Dry Sheathing ..... ₱ ℔ 1½¢
Eagle Brand Dry Sheathing ..... ₱ ℔ 2½¢

Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ $12.00. dis 50 & 10 %
K. P. & Co., Adze Eye, 6 to 7 ℔ $13.00..... dis 50 & 10 %

Planes.
Auburn Tool Co., Bench ..... dis 20&10 %
Auburn Tool Co., Fancy ..... dis 15&10 %
Auburn Tool Co., English Iron ..... dis 15&10 %
N. Y. Tool Co., Bench ..... dis 25&10 %

Plated Ware.—Rogers & Bro. ..... dis 50

Pliers.—Vom Cleff & Co.'s ..... net list
Button's Wire Pliers ..... dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co.. dis 65&10 %

Pocket Knives.—American Shear Co.'s ..... dis 40 %

Potato Diggers.—W. C. & Co., reduced list. dis 50 %
Eastern Tool Co.'s ..... dis 60 %

Pulleys.—Acme or Excelsior, 1¾ in ..... ₱ doz 22¢
Acme or Excelsior, 2 in ..... ₱ doz 25¢

Pulley Blocks. ..... dis 40 %

Pumps.—Union Manufacturing Co.
Iron Cistern ..... dis 40 %
Iron Pitcher Spout ..... dis 50 %
Copper ..... dis 30 %

Rivets.—Black (new list) ..... dis 40 %
Carriage in 10 ℔ papers (new list) ..... dis 40 %
Copper ..... dis 50 %

Razors.—Torrey's ..... dis 20 %

Rules.—Stanley, Boxwood ..... dis 70&10 %
Stanley, Ivory ..... dis 50&10 %

Sad Irons.—Common ..... ₱ ℔ 3¢
Laundry ..... ₱ ℔ 6¾¢
Tailors' Geese ..... ₱ ℔ 6 ¢
Enterprise "Potts'" ..... dis 35 %

Sash Locks.—King & Hutchinson's, new list. dis 40 %

Sandpaper.—Baeder & Adamson ..... dis 35 %

Sash Weights.—Patent Eye ..... ₱ ℔ 1¼¢

Saws.—Hand Saws, Disston's ..... dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth ..... ₱ foot 68¢, dis 40 %
Disston's Great American Tooth.. ₱ foot 68¢, dis 40 %
Boynton's Lightning Tooth ..... ₱ foot 45¢
M. B. & D., Hand Saws ..... dis 33⅓ %
W. M. & Co.'s Circular Saws ..... dis 35 %
Richardson Bros. ..... dis 35 %

Saw Blades.—Disston ..... dis 20 %
W. M. & C. ..... dis 10 %
Welch & Griffith, Extra ..... ₱ doz $7.20
Welch & Griffith, No. 2 ..... ₱ doz 6.00

Scales.—Fairbanks ..... dis 20 %

Screws.
American Flat-Head iron ..... new list, dis 75 %
American Flat-Head Brass ..... new list, dis 75 %
American Round-Head Brass ..... new list, dis 65 %
American Round-Head Iron ..... new list, dis 70 %
Grilley Round-Head Nickel-Plated Common. dis 50 %

Scythes.—Clippers, in boxes ..... ₱ doz $6.50

Shaves.—Kimball's ..... ₱ inch 7½¢
Watrous ..... dis 20 %

Shears.—American Shear Co., new list ..... dis 70 %

Shot.—Tatham's ..... ₱ ℔ 6¢

Shovels.—O. Ames, new list ..... dis 17½ %
O. Ames, other brands, new list ..... dis 17½ %

Sinks.—Magee Patent ..... dis 30 %

Snow Shovels. $4.00

Skates.—Union ..... dis 25 %
Acme ..... dis 25 %
Oxford Rink Roller ..... ₱ pair, $2.50
Union Roller ..... dis 25 %

Stocks and Dies.—King's ..... dis 10&5 %

Tacks.
Swedes Tinned ..... dis 30&10 %
Swedes Iron ..... dis 30&10 %
Gimp and Lace ..... dis 20&10 %
Copper Tacks ..... dis 30&10 %
All balance on list ..... dis 20&10 %

Traps.—Oneida, Genuine ..... dis 33⅓ %
Oneida, Imitation, H. & N ..... dis 60 %
Blake's ..... dis 40&10 %

Vises.—Simpson's Adjustable ..... dis 25&5 %
Howard Vise Co. ..... dis 25 %
Prentiss' ..... dis 20 %

Weather Strips.—Packer's ..... ₱ doz $4.50
Browne's Flexible Rubber ..... dis 30 %
In 25 feet boxes: No. 1, ⅛ in. wide, ₱ yard, 10¢; No. 2, ⅜ in., 15¢.; No. 3, ¾ in., 20¢.: No. 4, 1 in., 25¢
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Window Springs. ..... dis 35 %
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Wire Fence.
Washburn Painted Barbed ..... ₱ ℔ 5 ¢
Washburn Galvanized Barbed ..... ₱ ℔ 6 ¢

Wire Goods.—Gate Hooks and Eyes, &c., dis 75&10 %

Wrenches.—A. G. Coe's ..... dis 60 %
Girard Mfg. Co. ..... dis 60&10 %
Girard Agl. ..... dis 70&10 %
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Novelty for Common Tubs No. 2—10-inch. ₱ doz $30.00
" " " " No. 3—11-inch. ₱ doz 34.50
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Excelsior with Folding Bench No. A—10-inch ..... ₱ doz 48.00
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Novelty Set Tub, E ..... ₱ doz ....
Keystone, Wood Frame No. 1½ ..... ₱ doz ...
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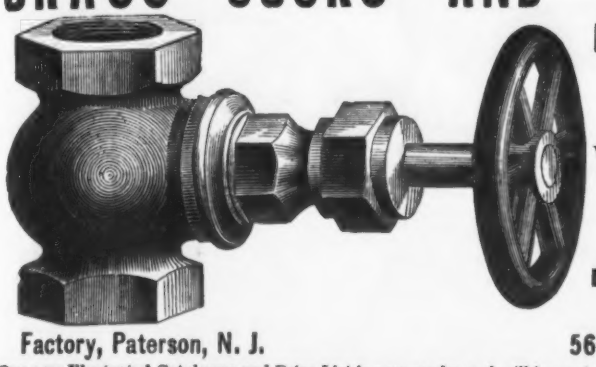

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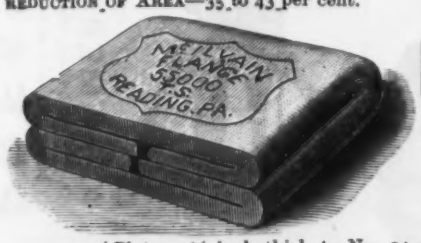

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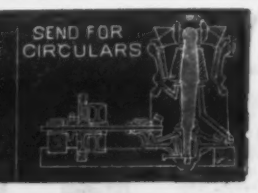

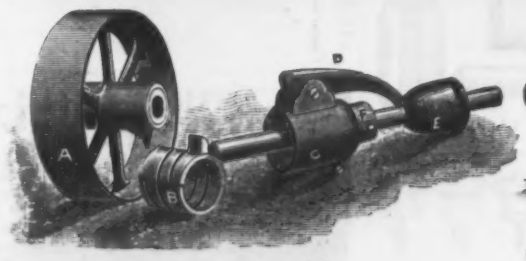

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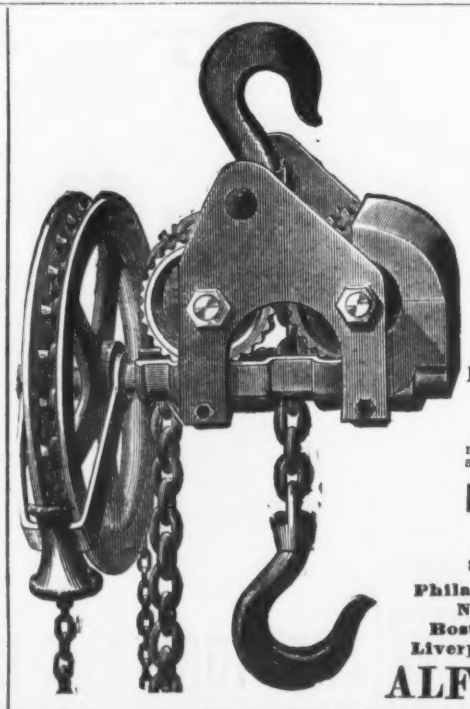

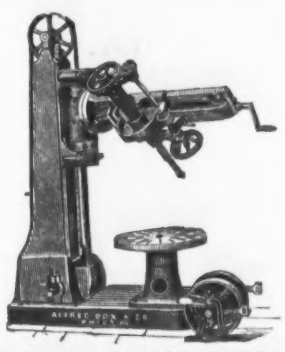

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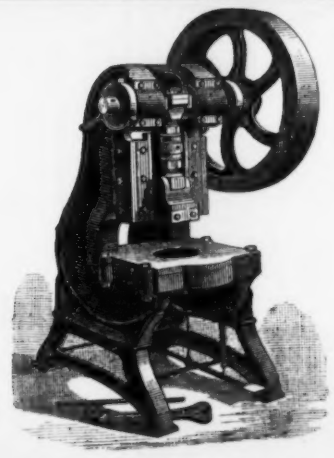

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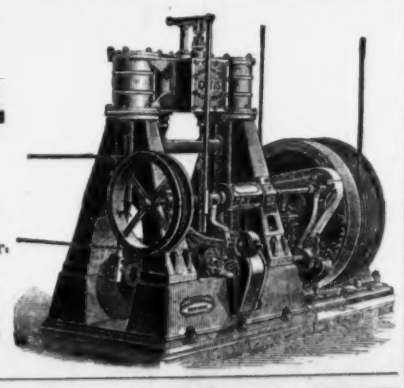

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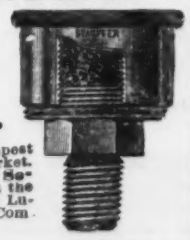

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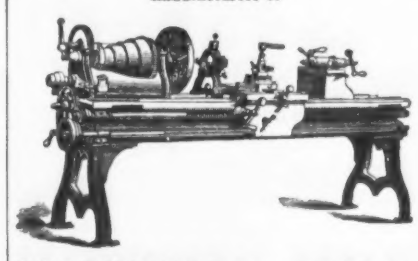

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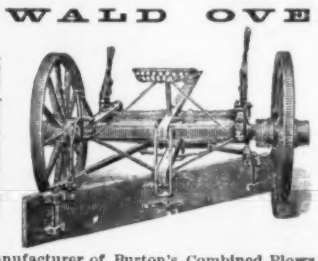

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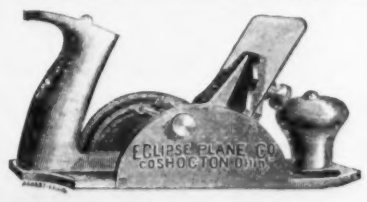

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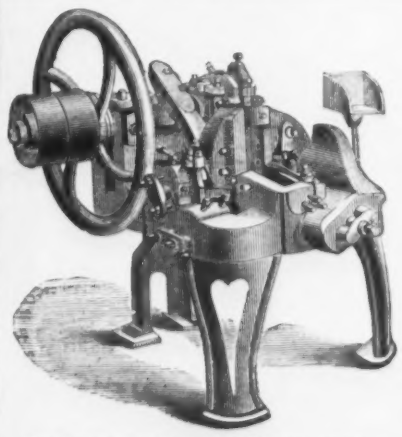

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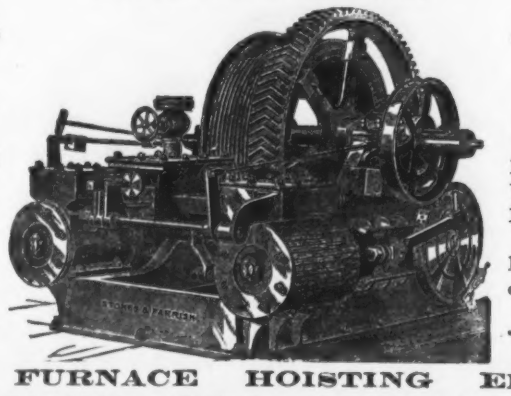

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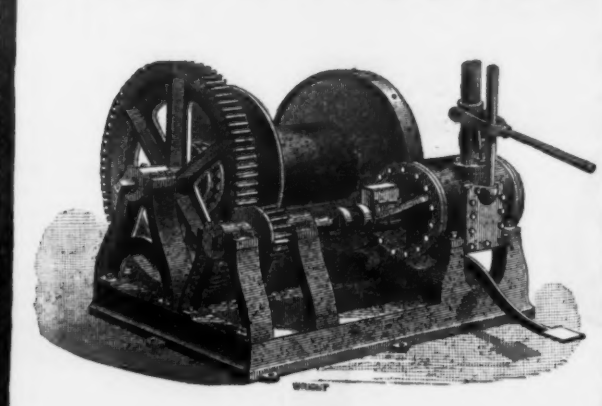

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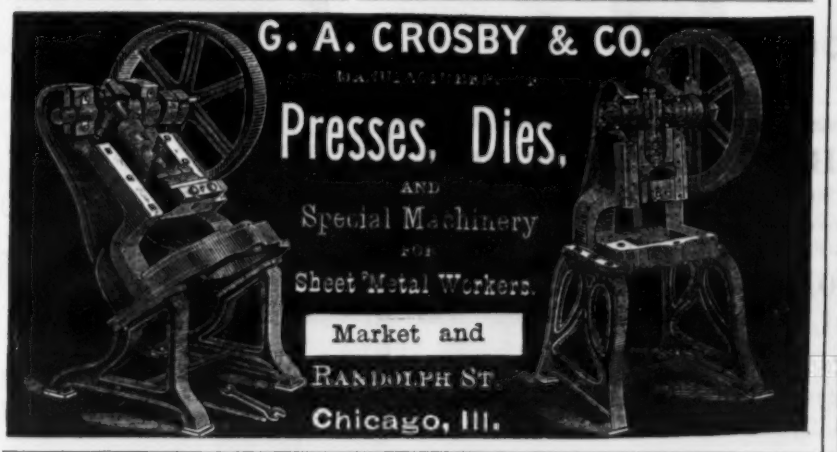

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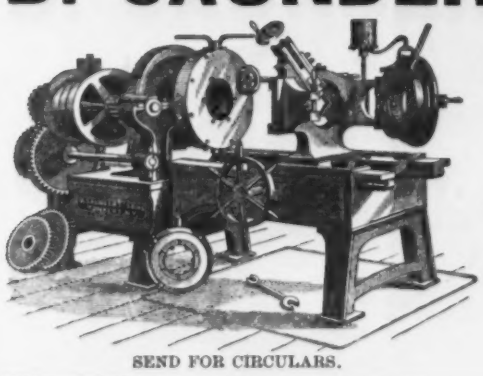

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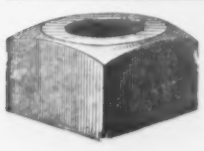

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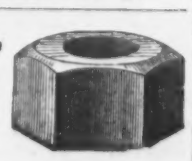

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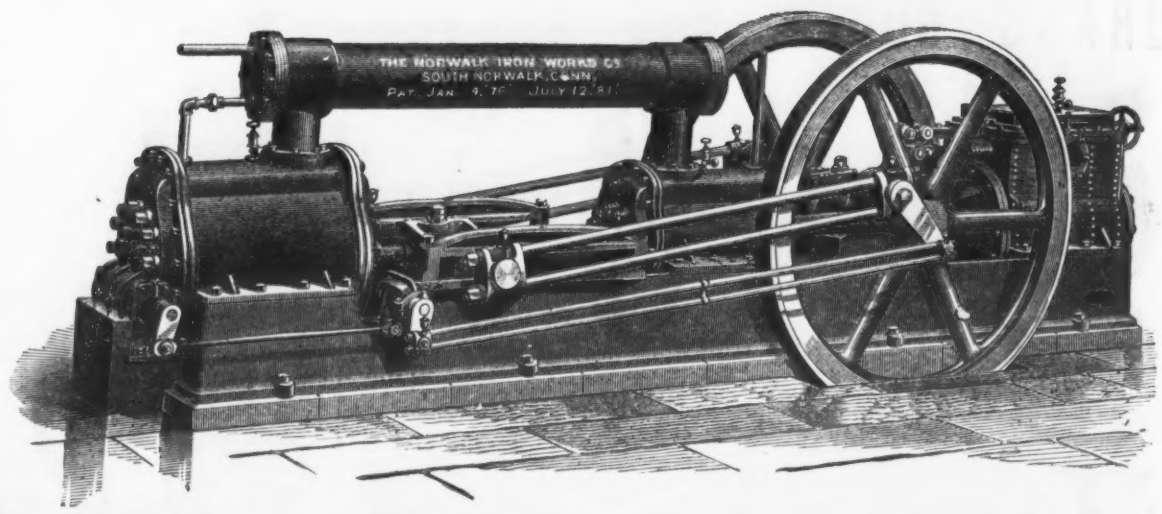

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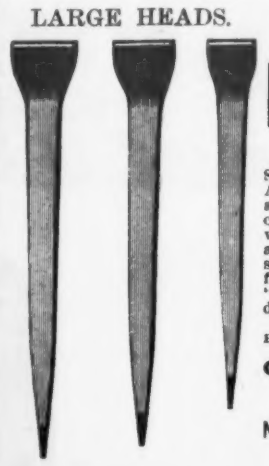

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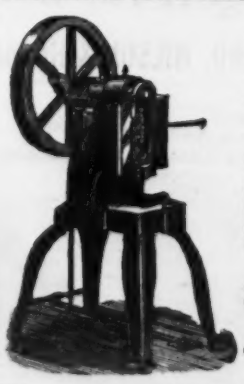

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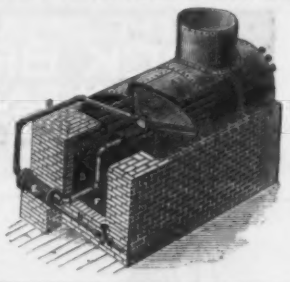

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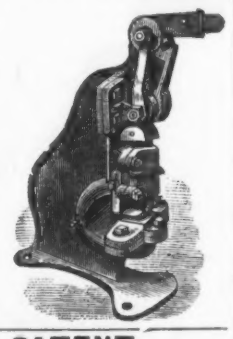

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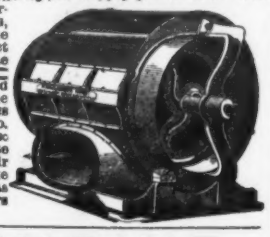

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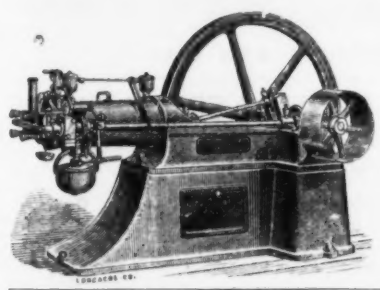

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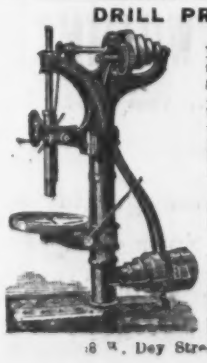

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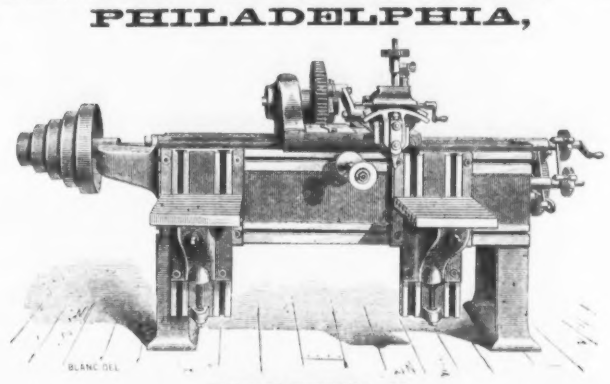

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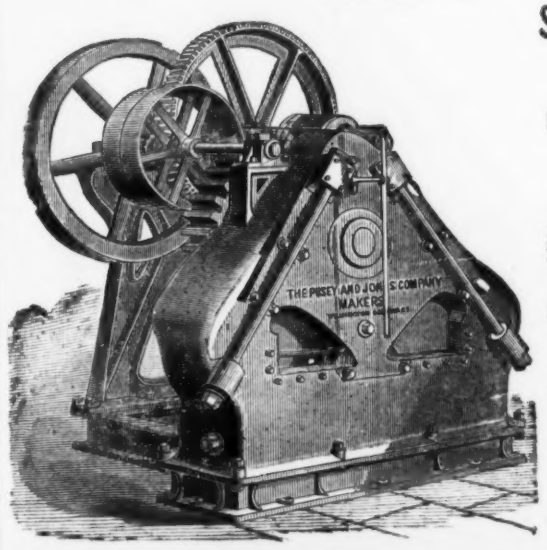

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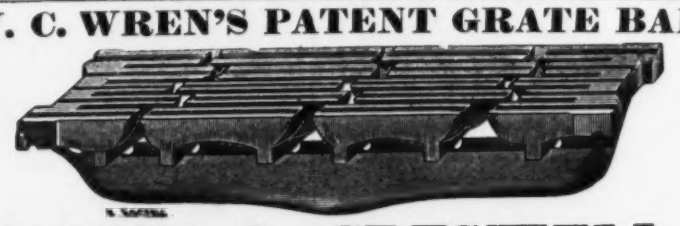

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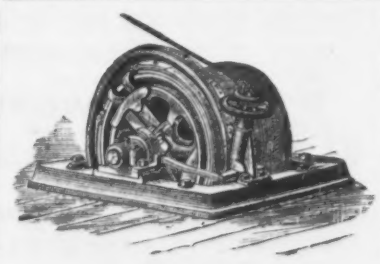

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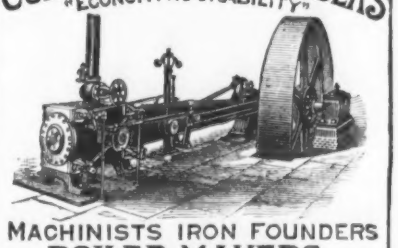

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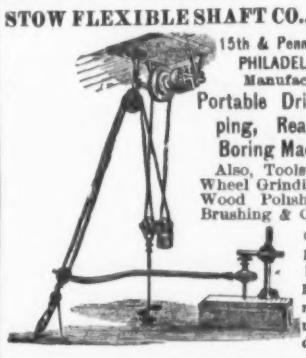

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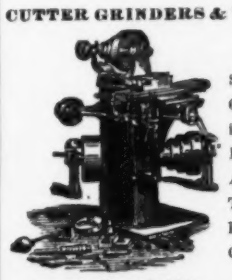

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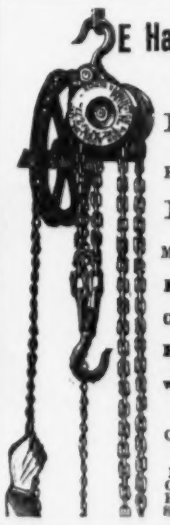

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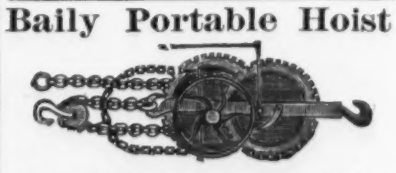

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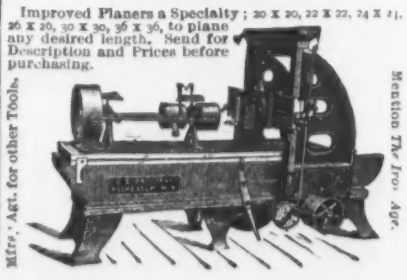
Water Street, Rochester, N. Y.

Improved Planers a Specialty; 20 x 20, 22 x 22, 24 x 24, 26 x 26, 30 x 30, 36 x 36, to plane any desired length. Send for Description and Prices before purchasing.



Mfrs.' Agt. for other Tools.

Mention The Iron Age.